February 2000

Port Enhancement Analysis

Phase I:

Port Workload Requirements for the Port of New York/New Jersey

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INTRODUCTION

This is Phase I of a two-phase study.

- Phase I identifies the quantity of cargo DOD plans to send through the seaport, and
- Phase II considers the ports' ability to handle their assigned workload.

The Military Traffic Management Command's Transportation Engineering Agency (TEA) has analyzed ports for years. With our Ports for National Defense Program, we survey the ports that are important to national defense, defining their capabilities. We then compare these capabilities to the demand imposed by a notional unit deploying through the port. From this, we assess the port's ability to meet its requirements. This methodology has suited us well in the past. However, as the deployment windows continue to shrink, we are forced to get our CONUS-based deploying forces through the ports faster than ever before. Compound this with the continued economic expansion in many of these areas, and it is becoming a challenge for the ports to dedicate real estate and facilities to respond to our requirements. This is particularly true in the early days of a contingency.

As a result, TEA realized the need for a more precise assessment of each port's ability to meet its requirements. We realized the need to base each port's requirements on the most demanding operation plan (OPLAN) for that port. Using our modeling capability, we can work with the tremendous quantity of information in an OPLAN time-phased force deployment data (TPFDD), massage the data, and extract the detail needed to get an accurate picture of the deployment through each port.

OBJECTIVES

The objectives of this initiative are:

Phase I:

(1) Define the OPLAN-based time-phased flow of cargo through the port during a demanding deployment. This flow is defined in terms of quantity and square feet.

(2) Allow planners to assign Transportation Terminal Brigades/Battalions (TTBs) to ports based on workload.

(3) Allow TTBs to adequately prepare for deployment operations.

(4) Validate the need for deploying units to support Sea Ports of Embarkation (SPOEs).

Phase II:

(1) Assist the port commander in quantifying real estate and facility support needed from the port.

(2) In instances where the port cannot meet their requirements, provide the quantitative basis to help both DOD and commercial planners assess potential "fixes." These fixes could include:

- Re-routing cargo to another port in the region,
- Re-timing the flow,
- Working through the local and metropolitan planning organizations to solicit federal funds, or possibly even
- Identifying areas where other funding could be applied.

METHODOLOGY

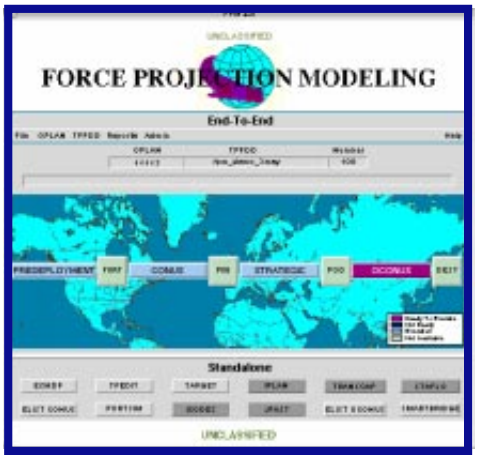
The following tools are utilized to analyze port workload:

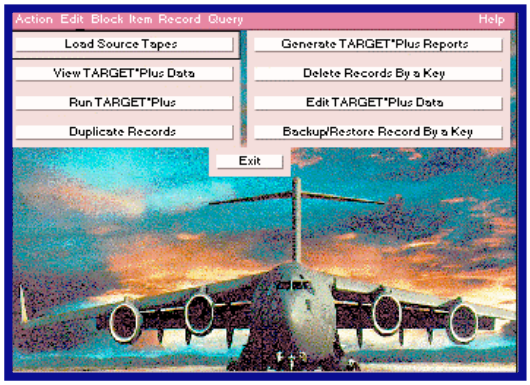
TPEDIT (TPFDD Editor) – An integrated set of automated processing tools that provides TPFDD editing and analysis capability. TPEDIT allows the analyst to:

- View the TPFDD graphically.
- Extract information for the seaport of embarkation (SPOE) of interest.
- Edit the TPFDD. Remove "on-call" and "shortfalled" records. Clean up data issues.
- Review data to determine the amount of cargo (number of ULNs/CINs, quantity, square feet, short tons, measurement tons) flowing through the port.

EXPANDED TPFDD - A database shared by the simulation models and used for tracking movement requirements at the individual item level of detail. Using the Expanded TPFDD the analyst can:

- Load the TPFDD into the Oracle database management system.
- "Expand" the TPFDD cargo detail within Oracle to Level 6 (individual item level of detail) for the SPOE of interest.





TARGET (Transportability Analysis Reports Generator) – A system of models and programs that provide the capability to generate movement requirements at the individual item level of detail (Level 6). The system merges force structure data from the Table of Organization and Equipment (TOE) or the Modified TOE (MTOE) with equipment characteristics from the Department of the Army Standard Equipment Characteristic File (ECF) to create unit equipment tables. With TARGET, the analyst:

- Assigns transport modes by ULN/CIN (convoy/rail).
- Selects transport assets.
  Containers (20' and 40')
  Railcars (89' flatcars, 60' flatcars, 68' DODX railcars).
- Determines convoy, rail, and container requirements.

FPM REPORTS – A set of customized reports extracts detailed cargo information from TARGET output files. These reports, when imported into Microsoft Excel, are the foundation of the port workload effort. The graphs are included in the results section of this report.

ASSUMPTIONS

- The requirements in this report represent:
  - The entire duration of the flow through the Port of New York/New Jersey as defined by the operation plan (OPLAN).
  - All records in the plan scheduled to move by sea under Military Sealift Command's (MSC) control.
  - The most demanding plan for the port. The plan may not necessarily be representative of the flow during an actual deployment.
- TPFDD Records not included in this analysis:
  - "On-call" records. These records are in the plan but are not scheduled to move – they appear with an available to load date (ALD) of 999.
  - "Shortfalled" records. These records are in the plan but are not sourced – they have not been matched with a specific unit.
  - Bulk petroleum, oils, and lubricants (POL) records (packaged POL is included).
- TARGET uses the following transport assets:
  Containers (20-foot, 40-foot)
  Convoy Vehicles (self-propelled, towed)
  Railcars (89-foot flatcars, 60-foot flatcars, 68-foot DODX railcars)
  NOTE: Commercial Motor was not utilized
- Containers are stuffed at their origin.
- TARGET stuffs containers and loads railcars with unit integrity. In addition, TARGET will not mix unit equipment and containers on the same railcar. This provides a potentially high containers and railcars requirement for each unit.
- If the origin is less than 400 miles from the seaport of embarkation (SPOE), roadable vehicles convoy from origin to SPOE. If the origin is greater than 400 miles from the SPOE, roadable vehicles are loaded onto railcars for transport to the SPOE. All nonroadable vehicles are loaded onto railcars for transport to the SPOE.
- The breakbulk category includes cargo coded in the TPFDD as containerizable with dimensions exceeding the allowable dimensions of a 20-foot container and nonvehicular cargo coded as noncontainerizable.

RESULTS

As a general rule, the Port Workload Requirements are derived directly from the TPFDD. Some necessary editing, in the form of "cleaning up" data, is performed. This, however, does not in any way change the intent of the requirement spelled out in the TPFDD. Instead, it contributes to the accuracy of the final result. This is not the case for the analysis of cargo deploying through the Port of New York/New Jersey. For a variety of reasons, the TPFDD does not show units from Fort Drum deploying through the Port of New York/New Jersey. These units, instead, are scheduled to deploy through the Port of Wilmington, North Carolina. Based on discussions with MTMC HQ, MTMC DSC, and others, we decided to "adjust" the requirements for the Port of New York/New Jersey to include units from Fort Drum. We believe this enhances both the accuracy and the integrity of the port's workload requirements.

According to the TPFDD, there are in excess of 20 origins sending cargo to the Port of New York/New Jersey, as shown in Figure 2. The Port of New York/New/Jersey receives a mix of Army, Navy, Air Force, Marine Corps, and Joint sustainment cargo. All aircraft self-deploy to the port. Origins in excess of 400 miles send all of their cargo to the port by rail. Origins within 400 miles convoy their roadable vehicles to the port and send everything else by rail. Figures 3 through 7 show the quantity of transports (containers, railcars, self-deploying aircraft, and convoying vehicles) required to move to the Port of New York/New Jersey.

Figures 8 through 13 illustrate the quantity of items arriving at the port. Figure 8 is the total quantity of items. Figures 9 through 13 break this down into more detail. Figures 9 and 10 are the quantity of vehicles arriving at the port. Figure 9 outlines the wheeled vehicles and Figure 10 lays out the tracked vehicles. These vehicles are further broken into categories, as shown in the table below. Figure 11 shows the quantity of aircraft arriving at the port. These are all UH-60 helicopters, and all move to the Port of New York/New Jersey under their own power. Figures 12 and 13 outline the number of containers and breakbulk cargo items, respectively, arriving at the port.

Categories of Vehicles

	Wheeled Vehicles	Tracked Vehicles
Light	Less than 5 ST	Less than 20 ST
Medium	5-30 ST	20-35 ST
Heavy	Greater than 30 ST	Greater than 35 ST

Similar to Figures 8 through 13, which lay out the quantity of items arriving, Figures 14 through 19 outline the square footage of these categories of cargo.

rail

Figures 20 through 27 show how cargo is arriving at the port of New York/New Jersey. Figures 20 through 23 show the number of cargo items arriving by convoy, , or self-deploying (aircraft). Figures 24 through 27 show the square footage of cargo arriving by each mode.

As shown earlier, cargo arrives at the Port of New York/New Jersey from many origins. Figure 28 shows visually the amount of cargo coming from each origin.

Figures 29 and 31 show the quantity of square footage, respectively, of cargo arriving at the Port of New York/New Jersey by origin. Figure 30 is the quantity of containers arriving at the port from each origin.

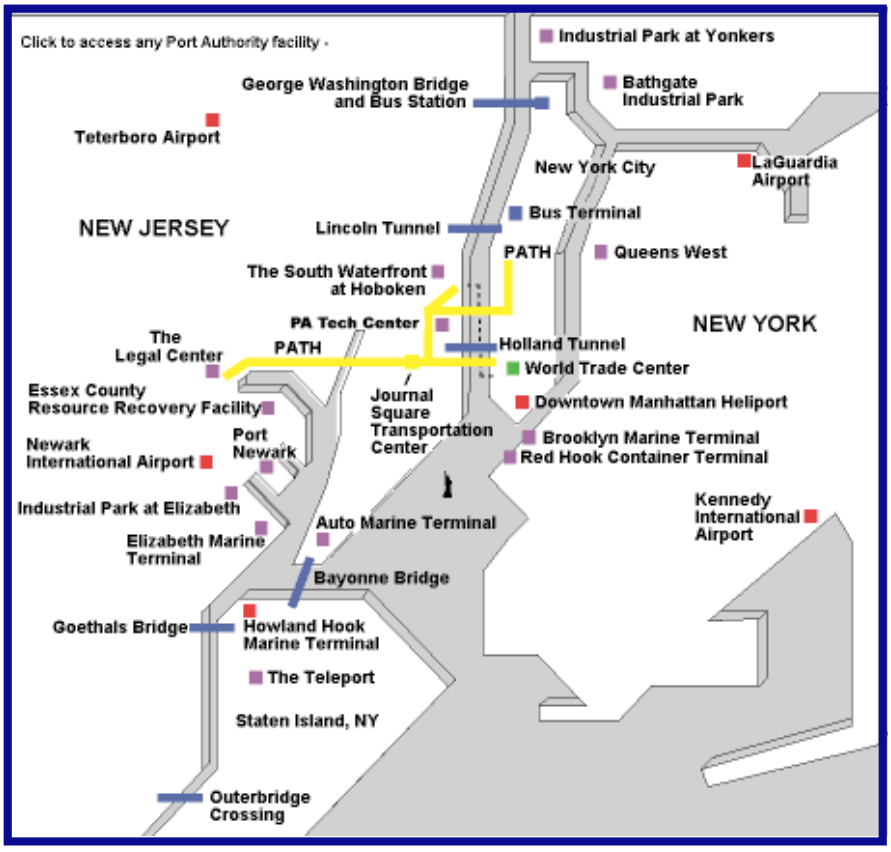


Figure 1. The Port of New York/New Jersey

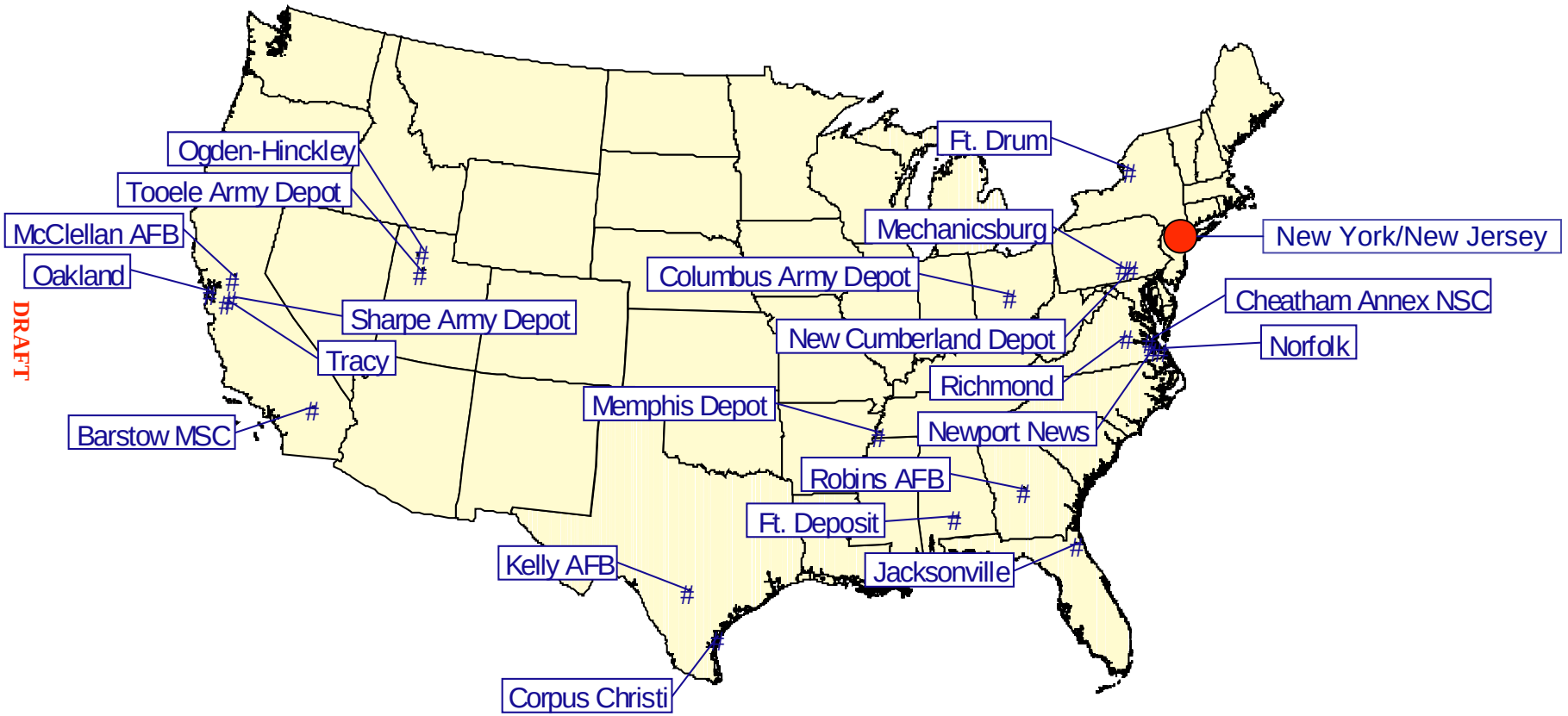


Figure 2. Cargo Arrives at the Port of New York/New Jersey from many Origins

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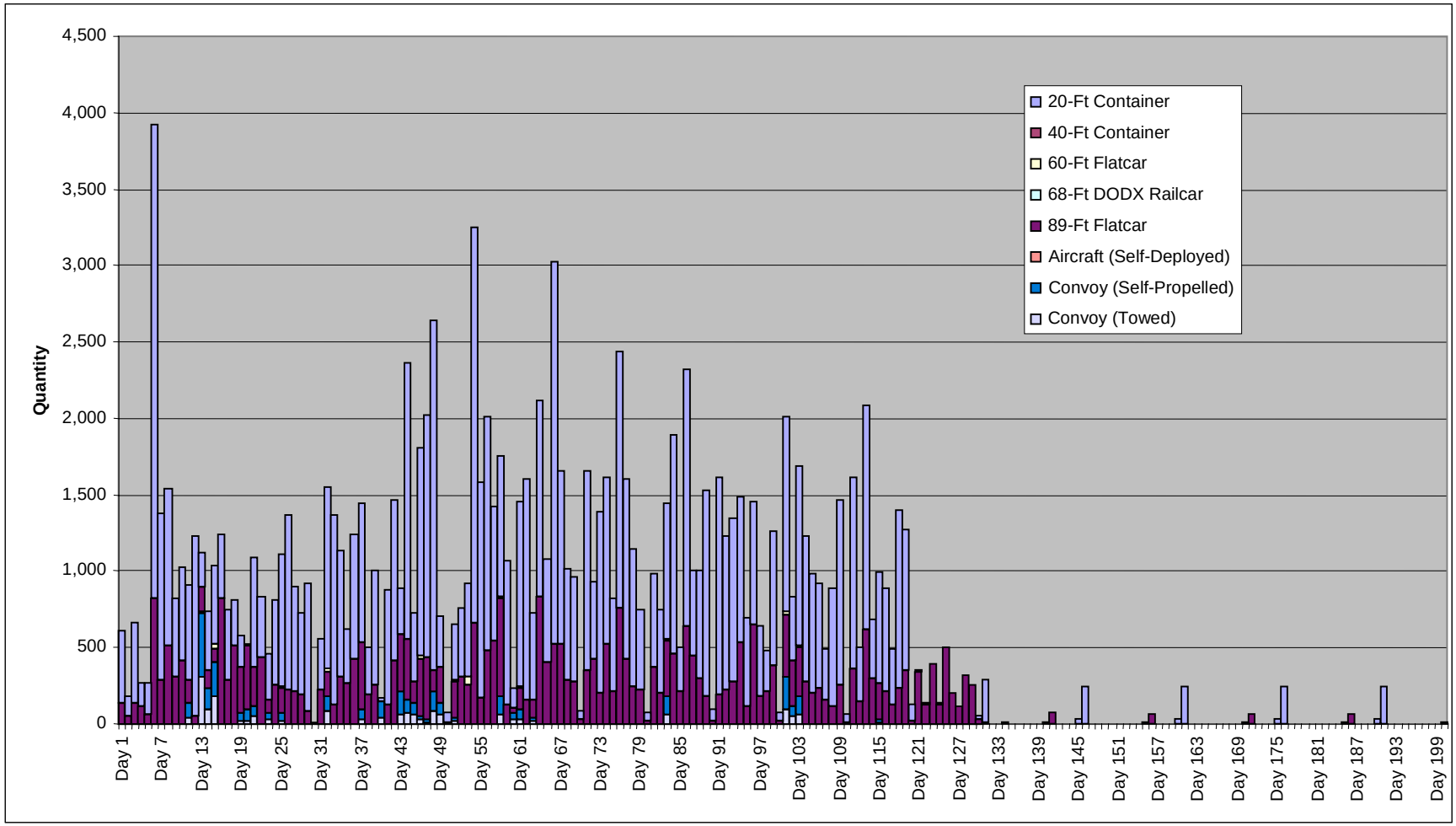

Figure 3. Total Quantity of Transports Arriving at the Port New York/New Jersey

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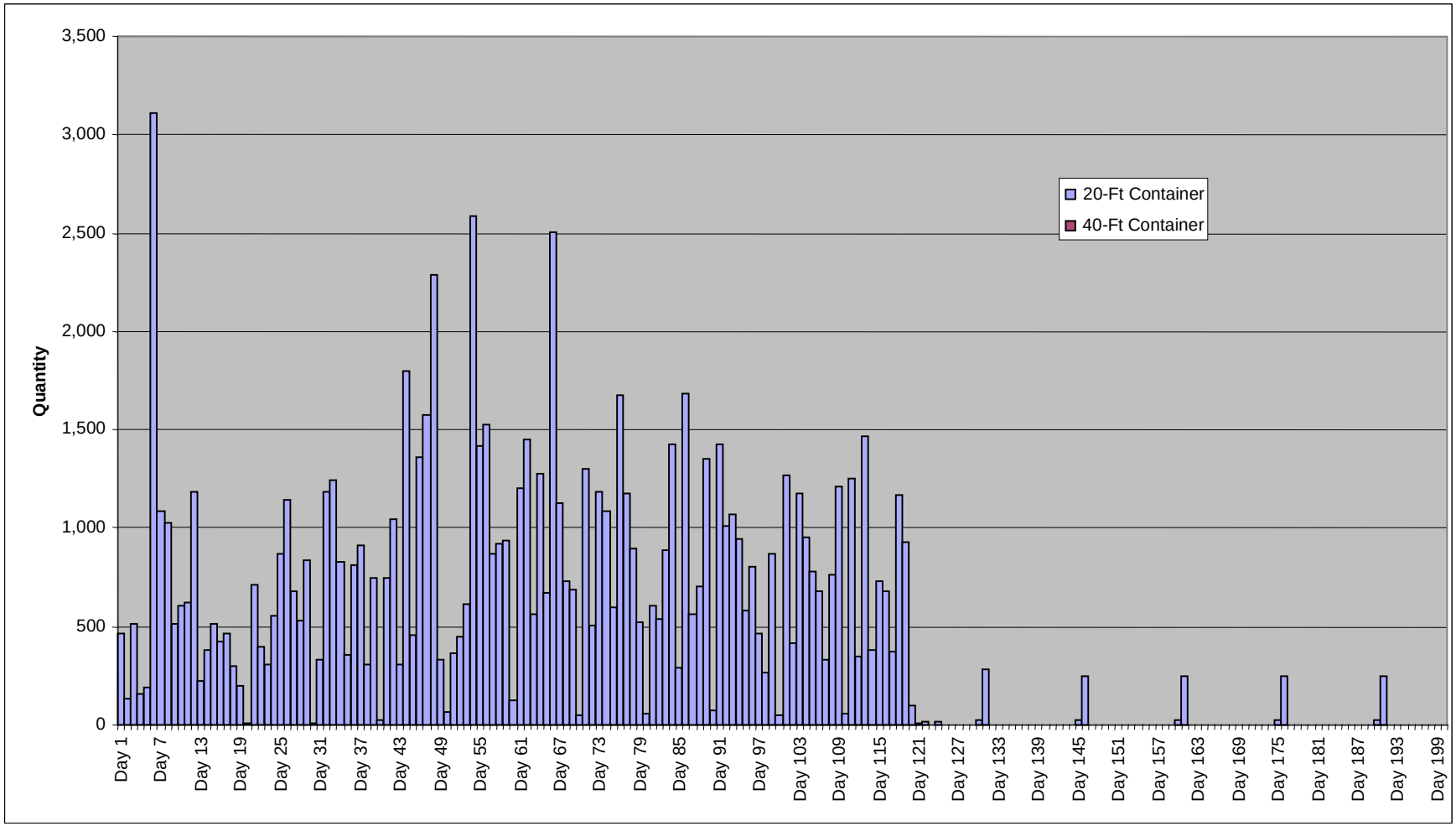

Figure 4. Quantity of Containers Arriving at the Port New York/New Jersey

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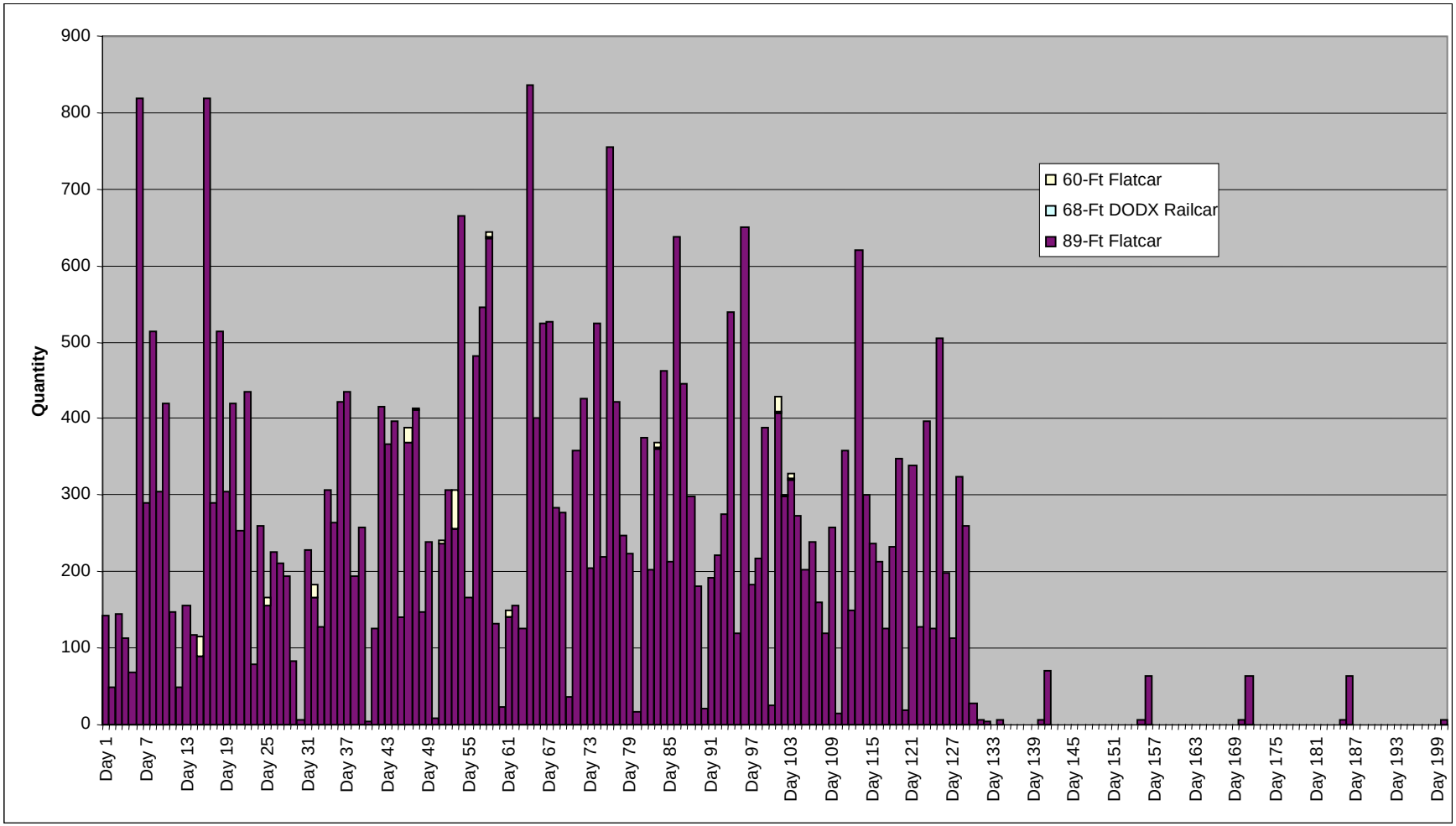

Figure 5. Quantity of Railcars Arriving at the Port New York/New Jersey

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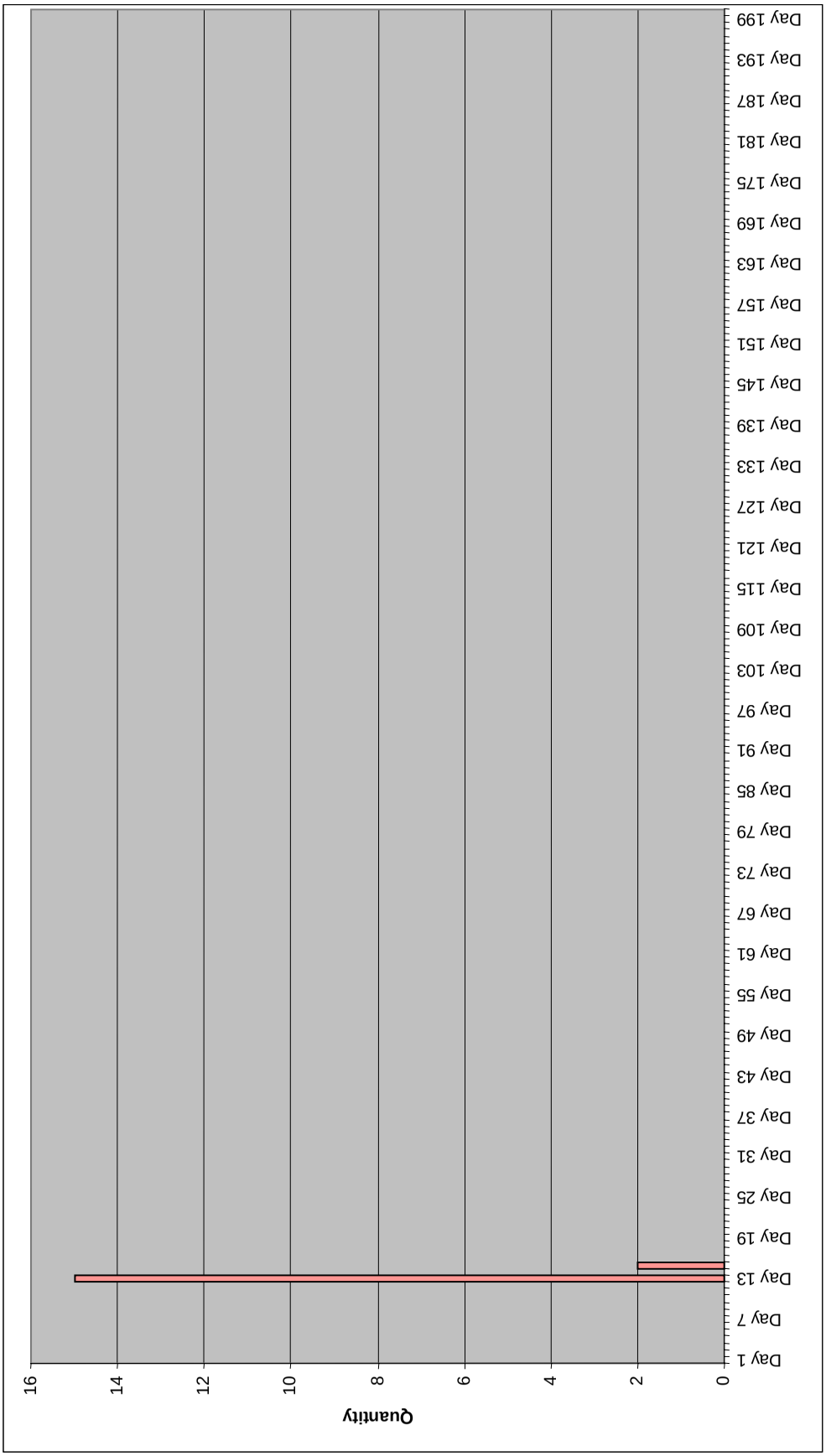

Figure 6. Quantity of Aircraft Arriving at the Port New York/New Jersey

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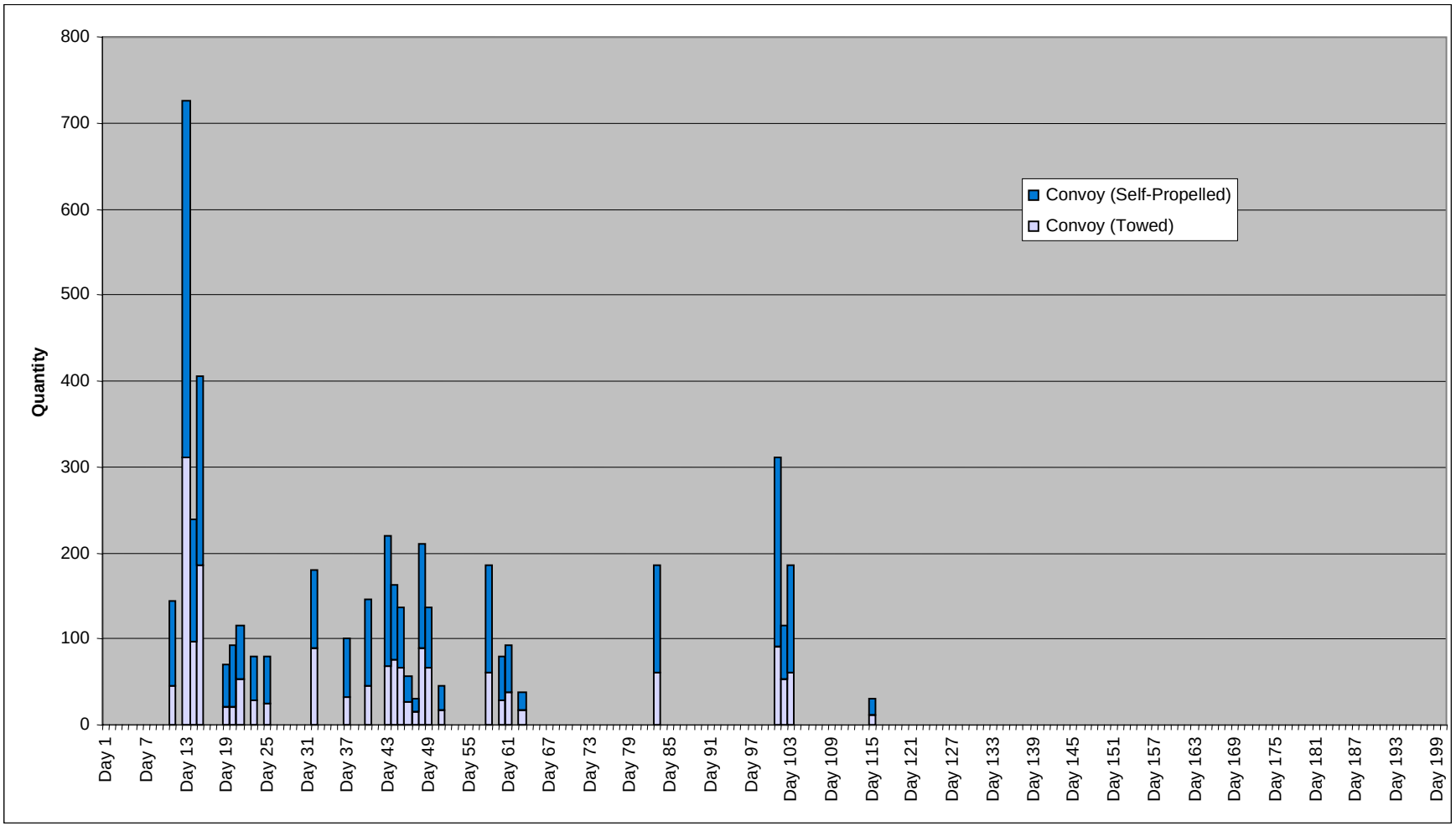

Figure 7. Quantity of Convoy Vehicles Arriving at the Port New York/New Jersey

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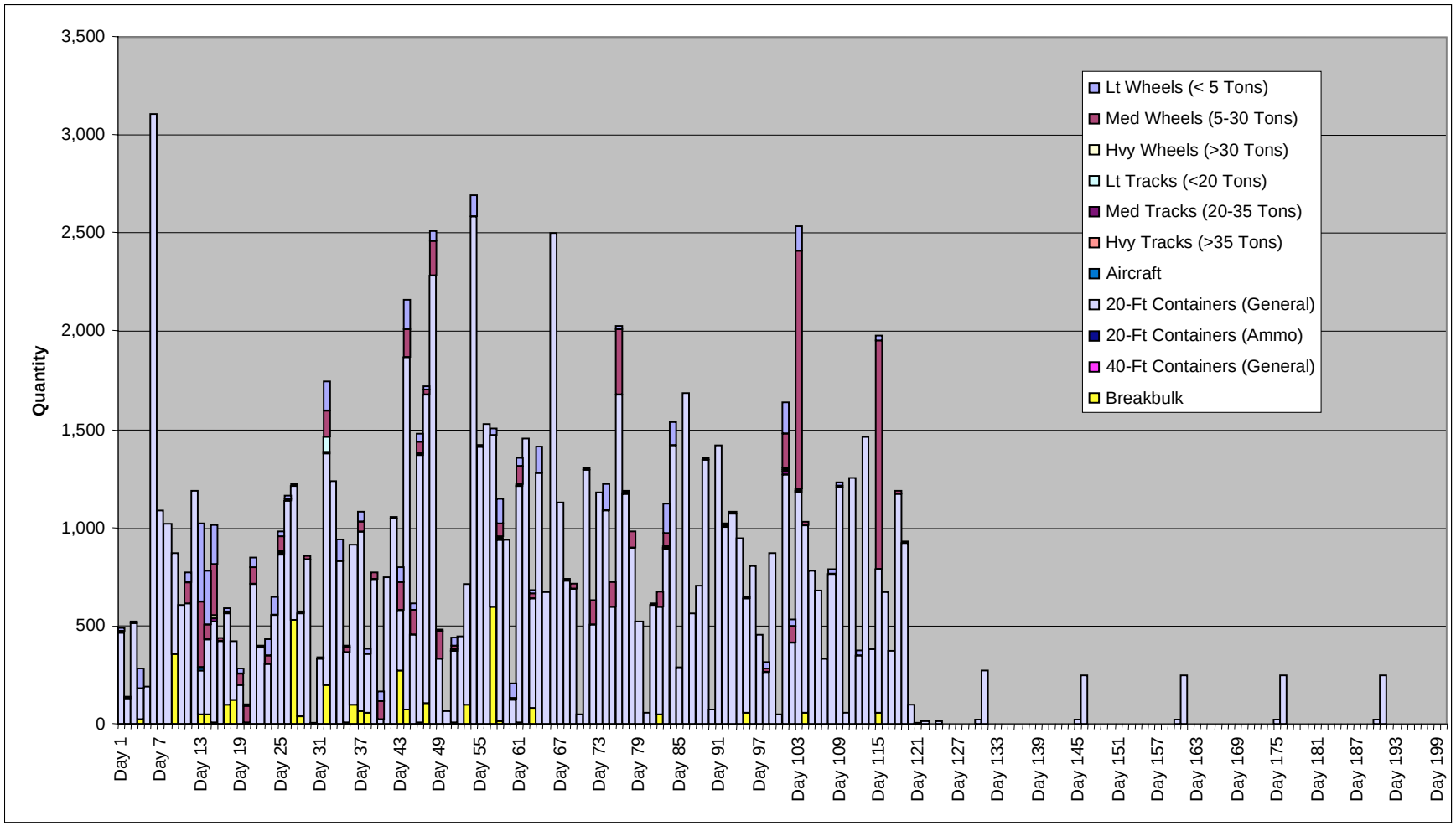

Figure 8. Total Quantity of Items Arriving at the Port New York/New Jersey

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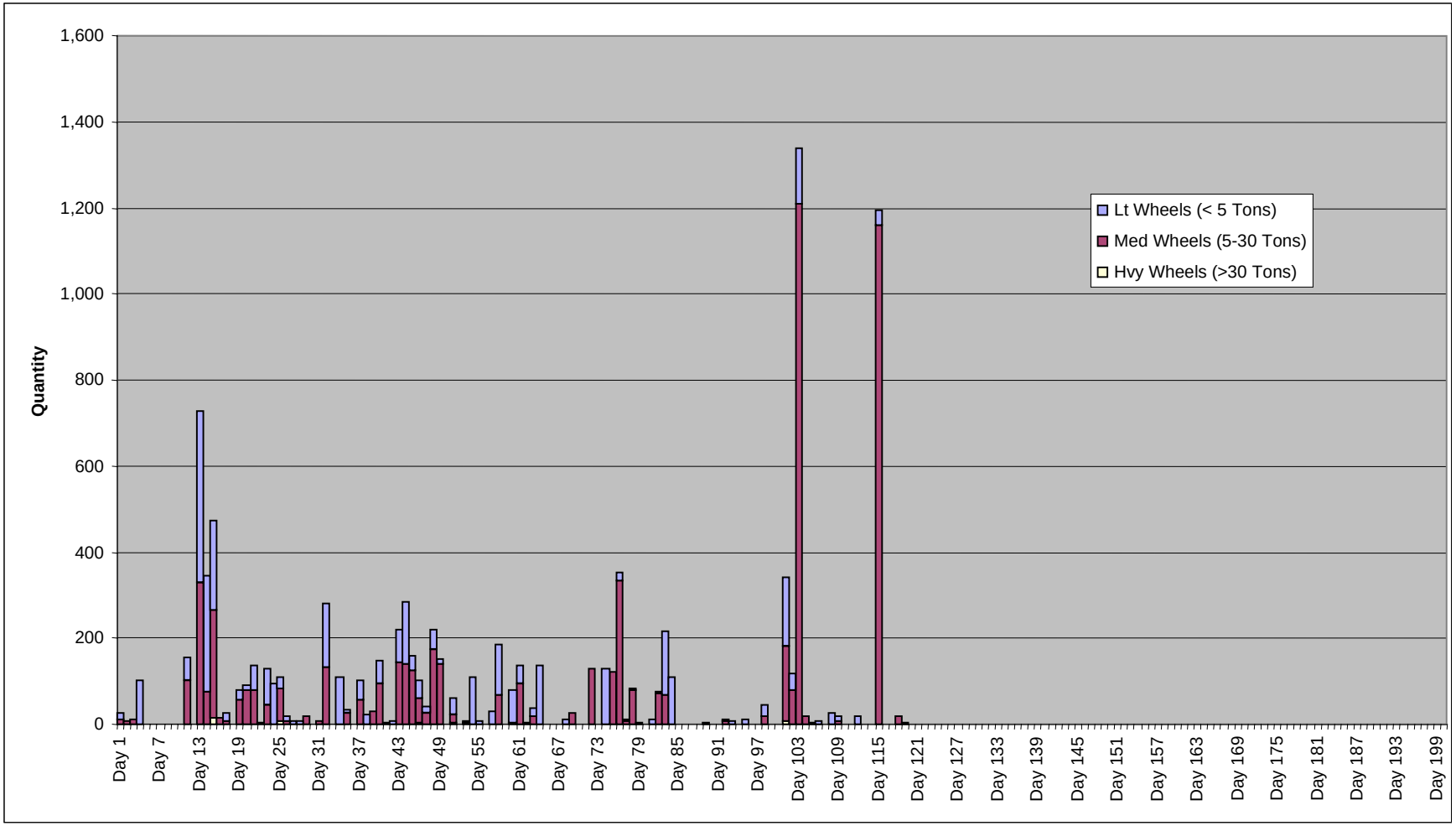

Figure 9. Quantity of Wheeled Vehicles Arriving at the Port New York/New Jersey

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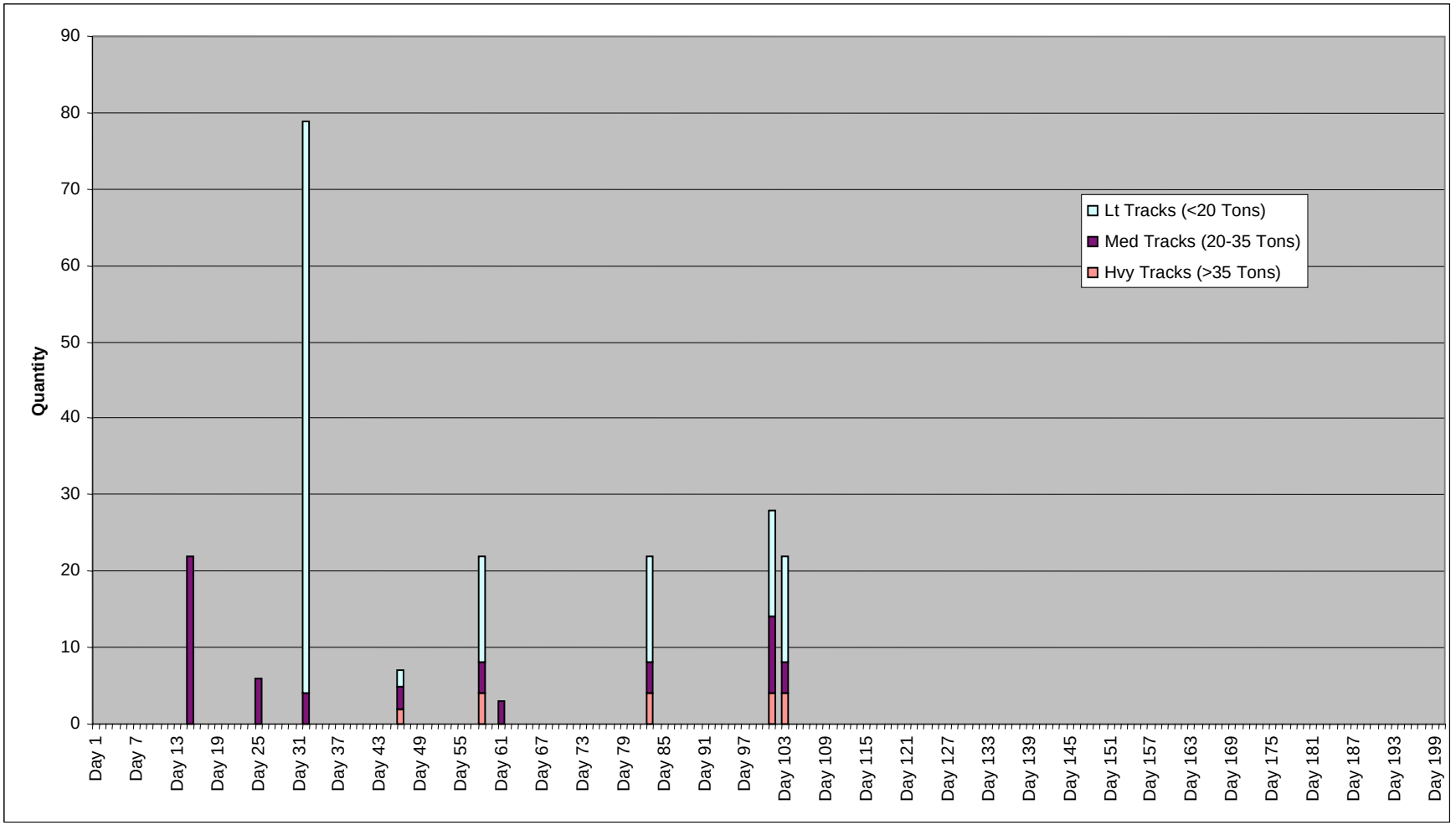

Figure 10. Quantity of Tracked Vehicles Arriving at the Port New York/New Jersey

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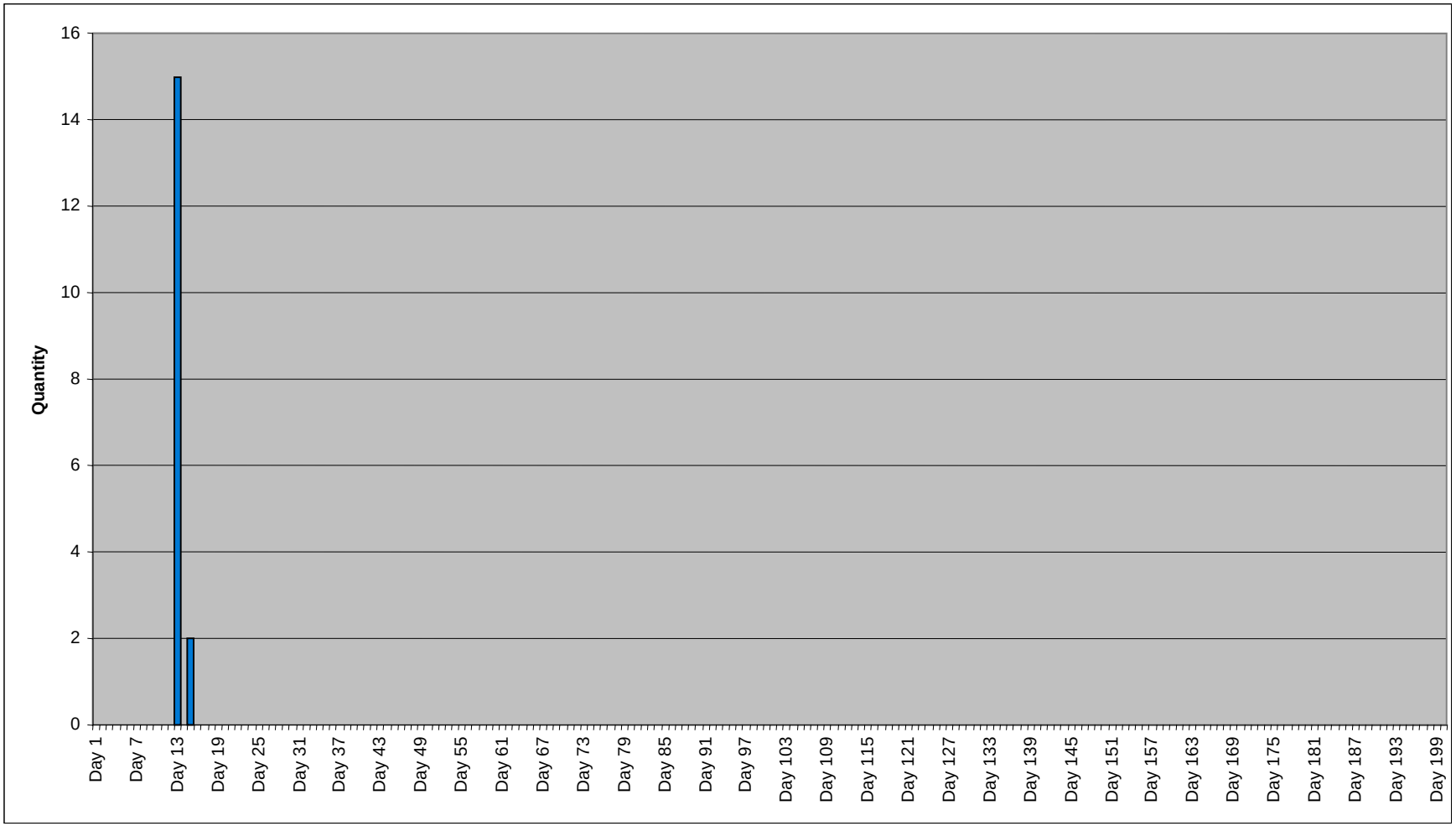

Figure 11. Quantity of Aircraft Arriving at the Port New York/New Jersey

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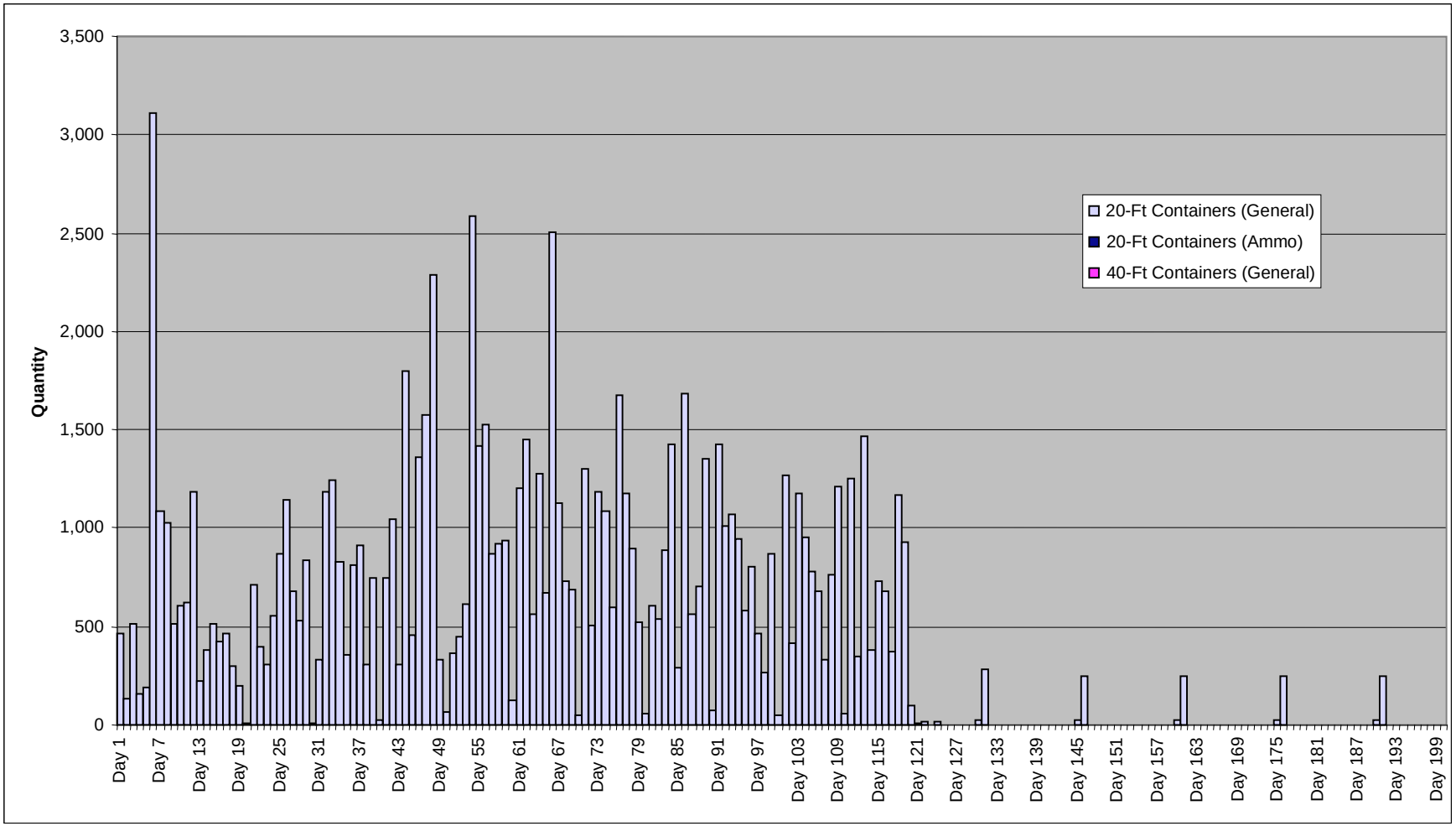

Figure 12. Quantity of Containers Arriving at the Port New York/New Jersey

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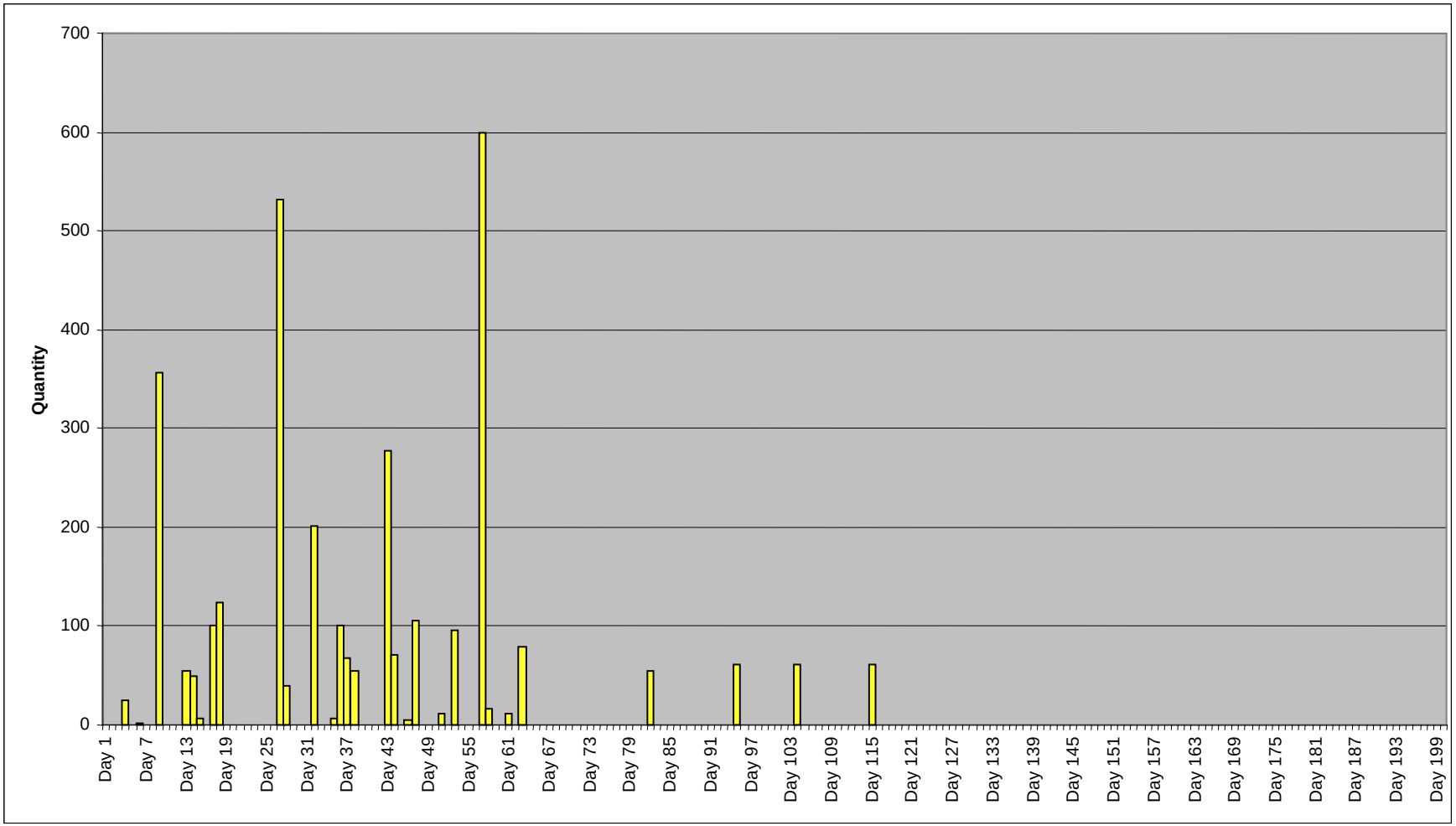

Figure 13. Quantity of Breakbulk Cargo Items Arriving at the Port New York/New Jersey

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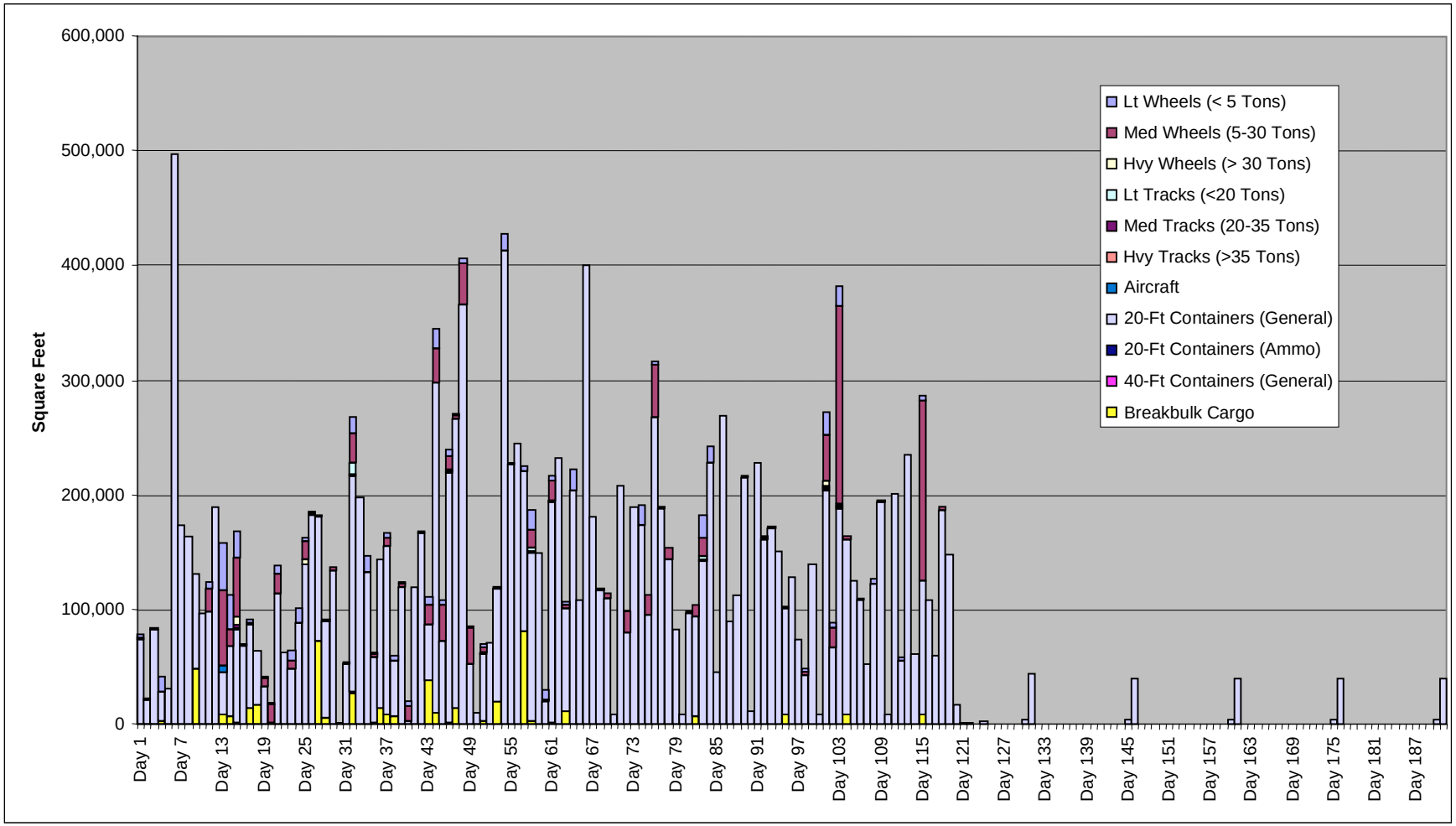

Figure 14. Total Square Feet of Cargo Arriving at the Port New York/New Jersey

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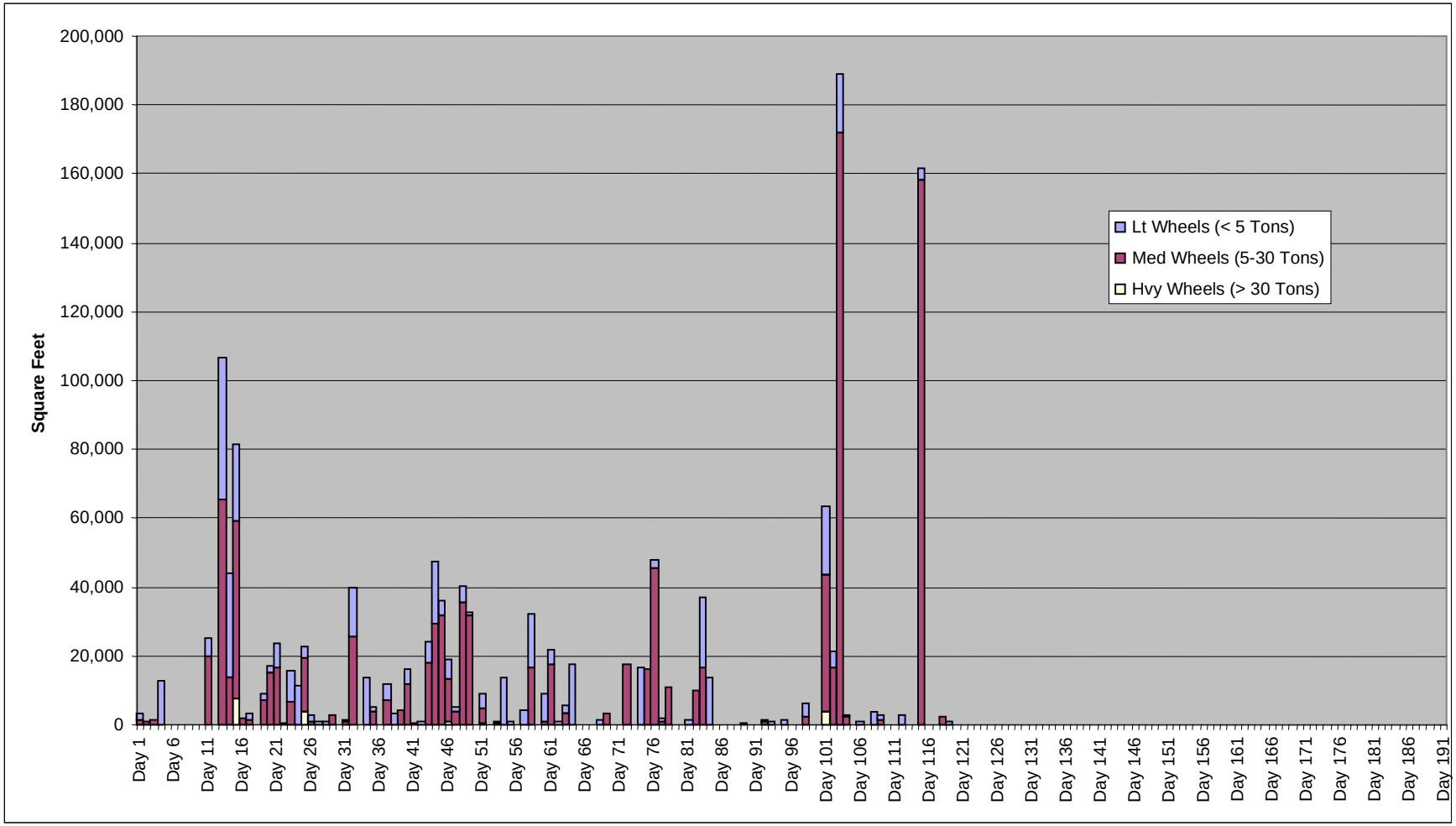

Figure 15. Square Feet of Wheeled Vehicles Arriving at the Port New York/New Jersey

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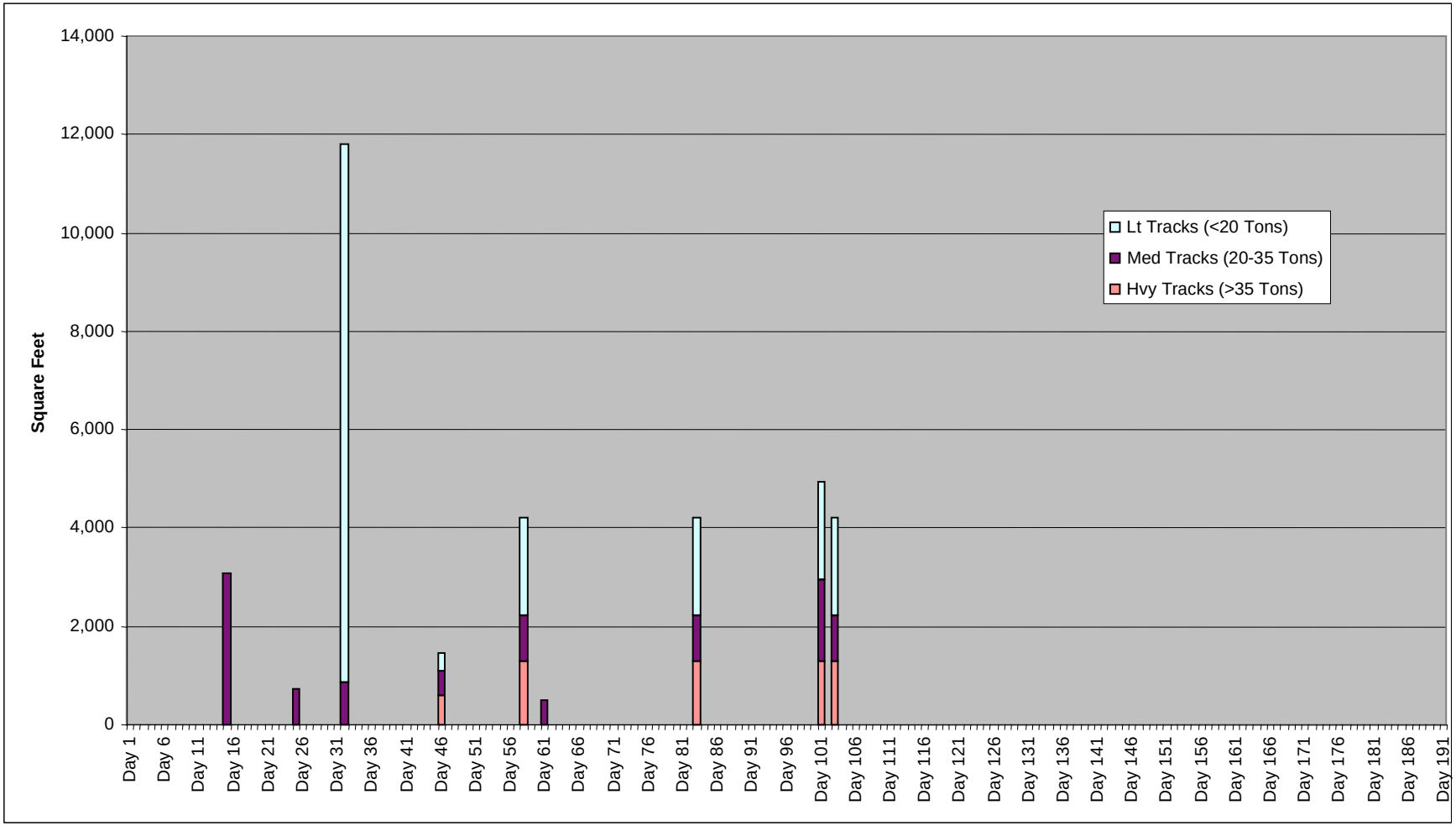

Figure 16. Square Feet of Tracked Vehicles Arriving at the Port New York/New Jersey

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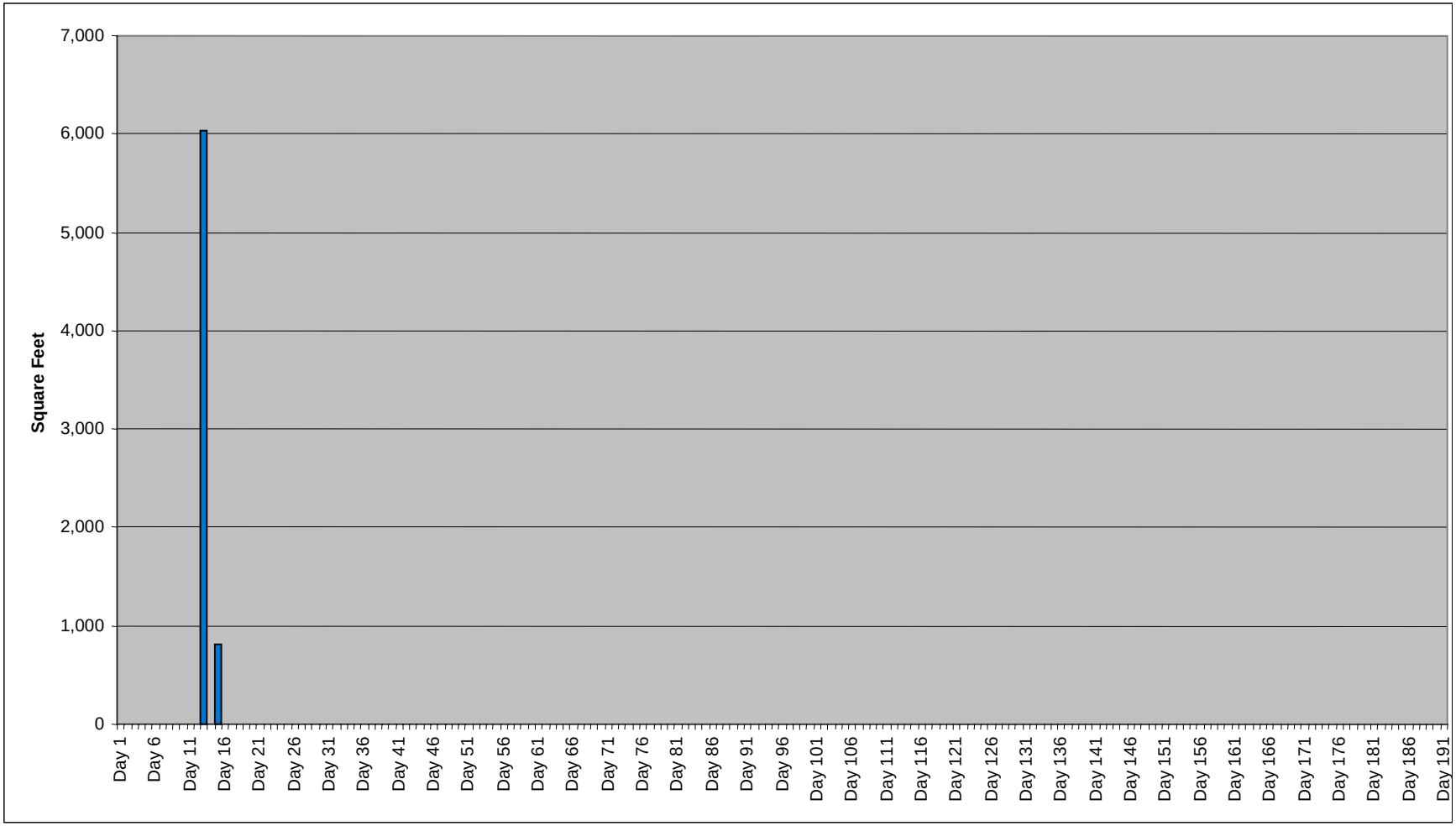

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Figure 17. Square Feet of Aircraft Arriving at the Port New York/New Jersey

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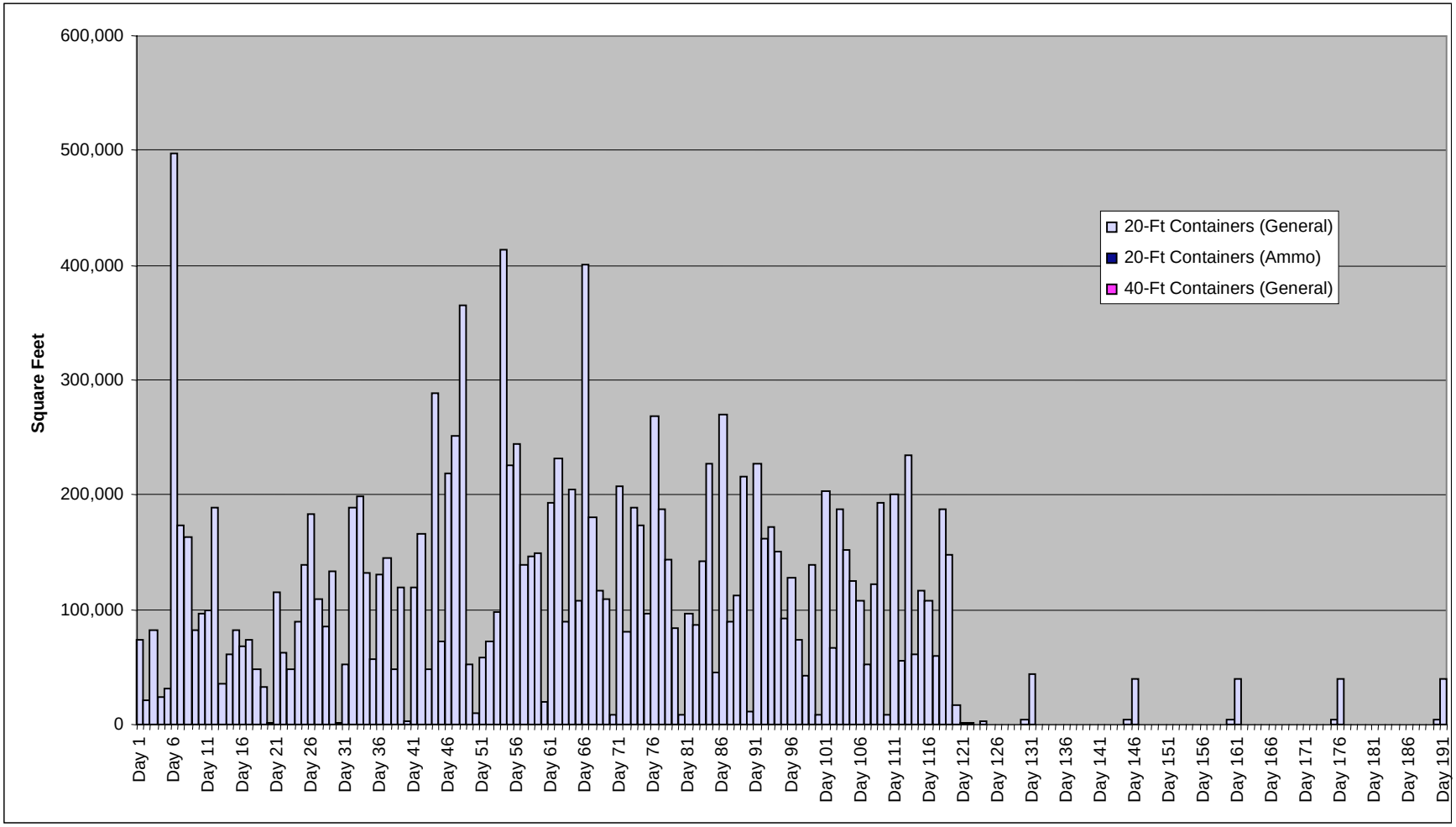

Figure 18. Square Feet of Containers Arriving at the Port New York/New Jersey

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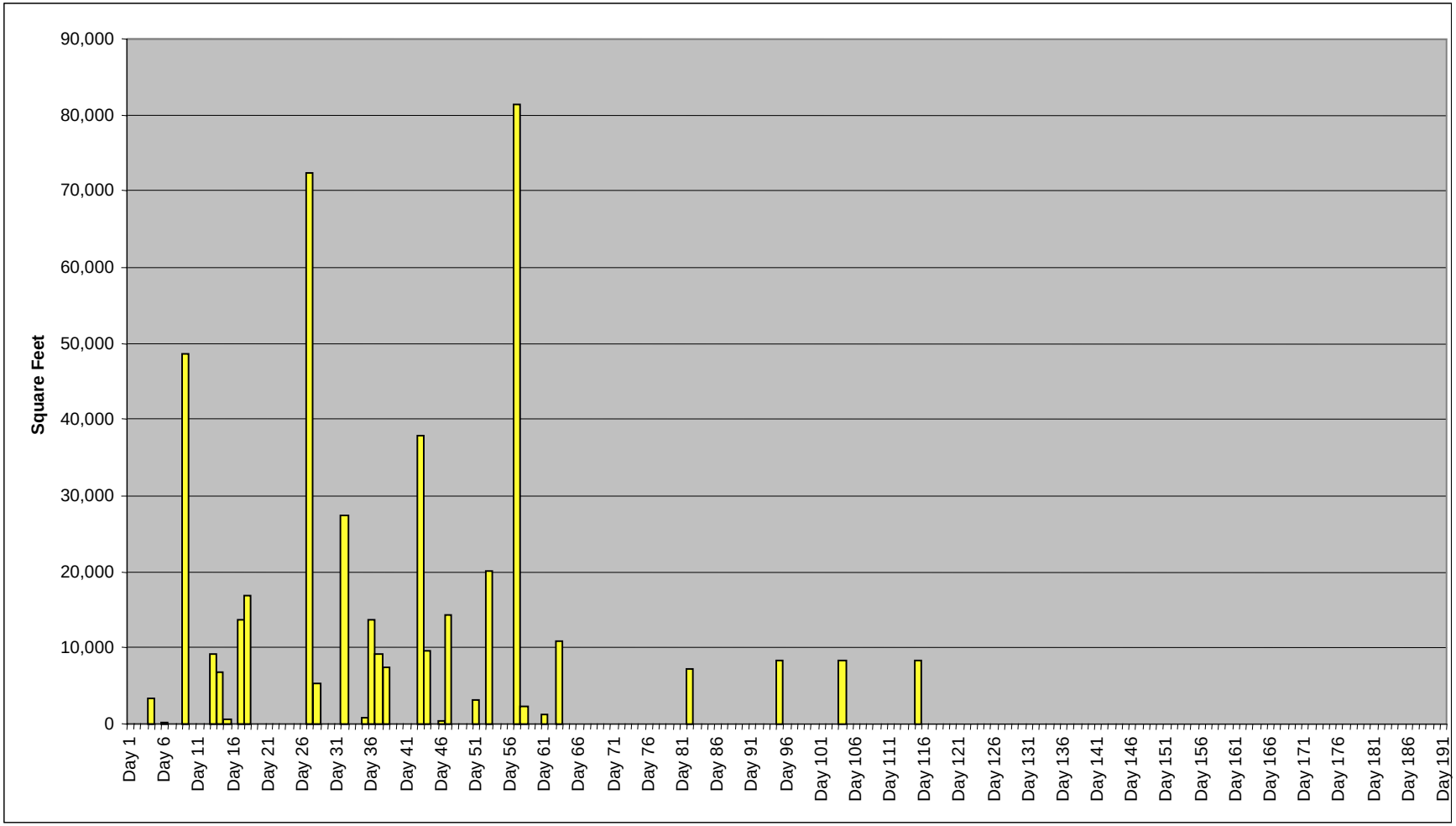

Figure 19. Square Feet of Breakbulk Cargo Items Arriving at the Port New York/New Jersey

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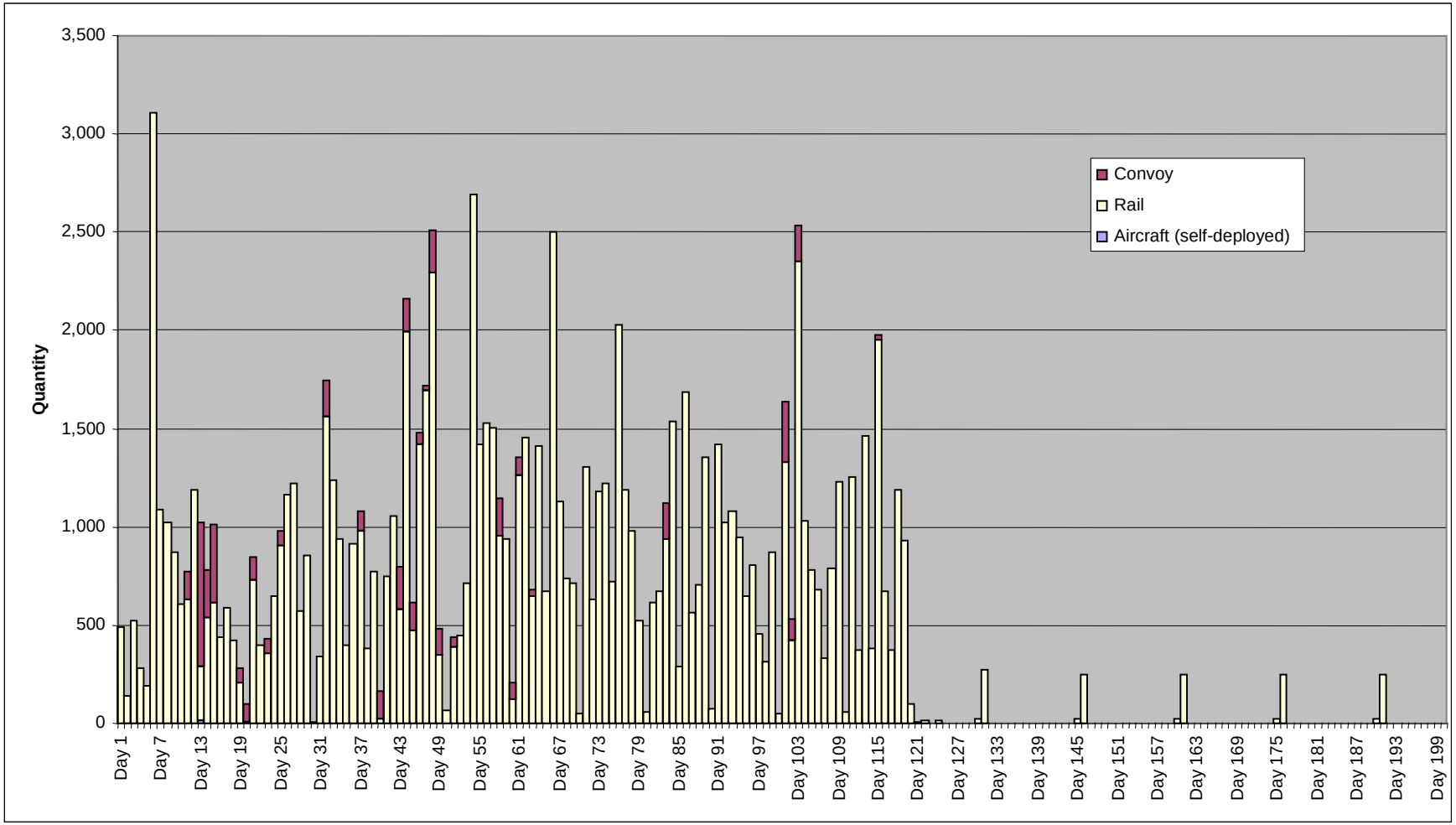

Figure 20. Quantity of Items Arriving by Mode to the Port New York/New Jersey

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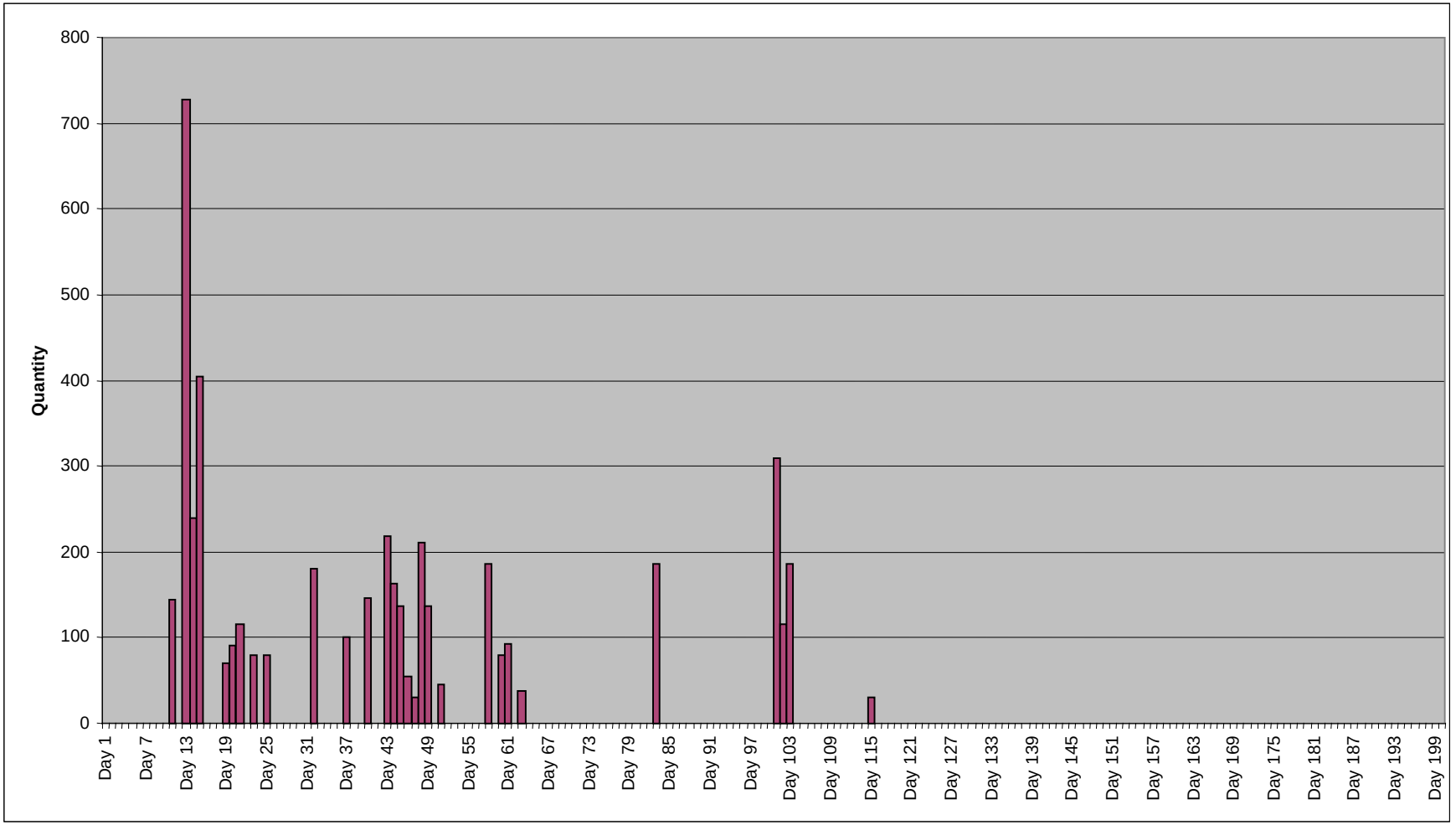

Figure 21. Quantity of Wheeled Vehicles Convoying to the Port New York/New Jersey

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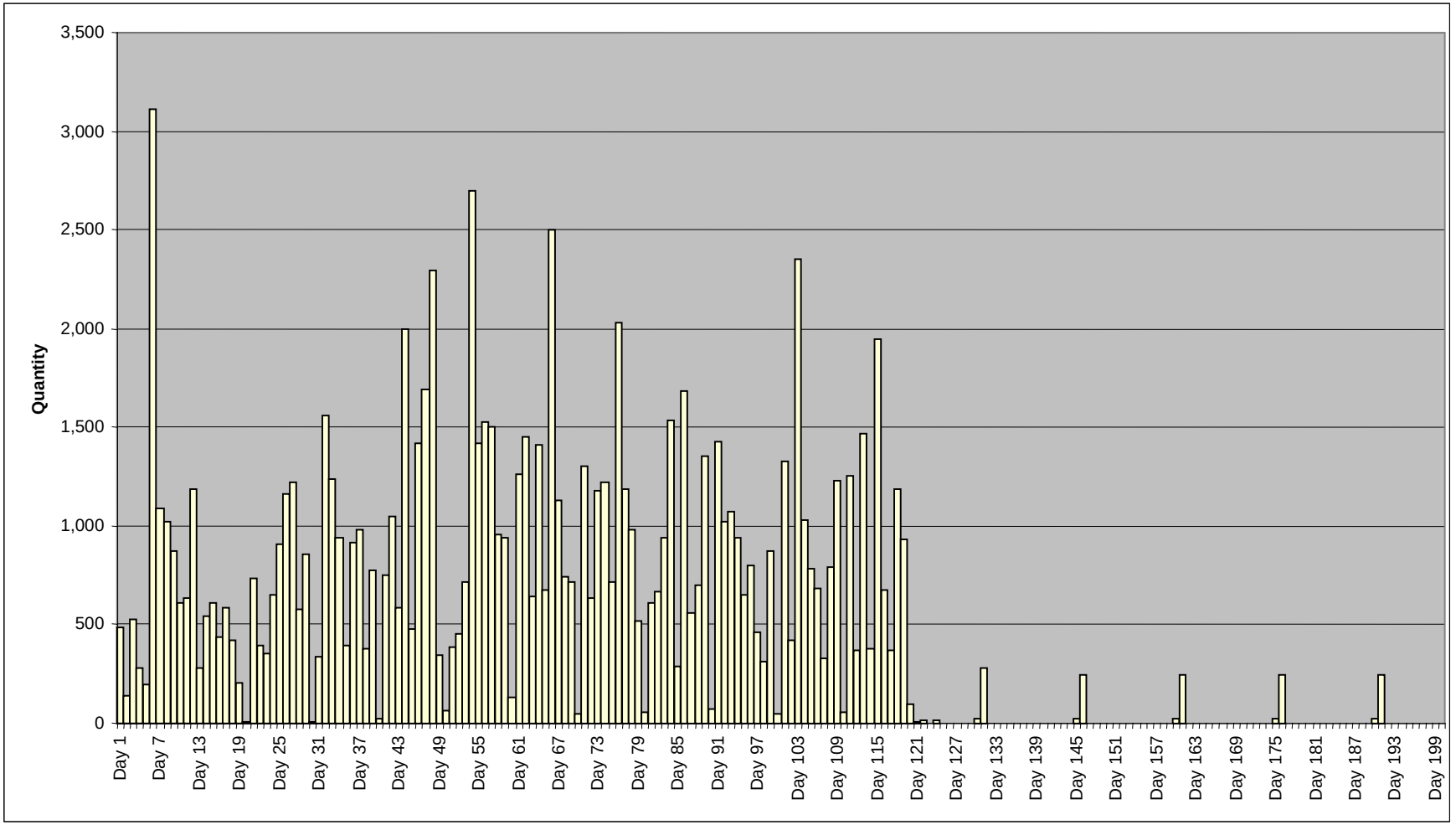

Figure 22. Quantity of Items Arriving by Rail to the Port New York/New Jersey

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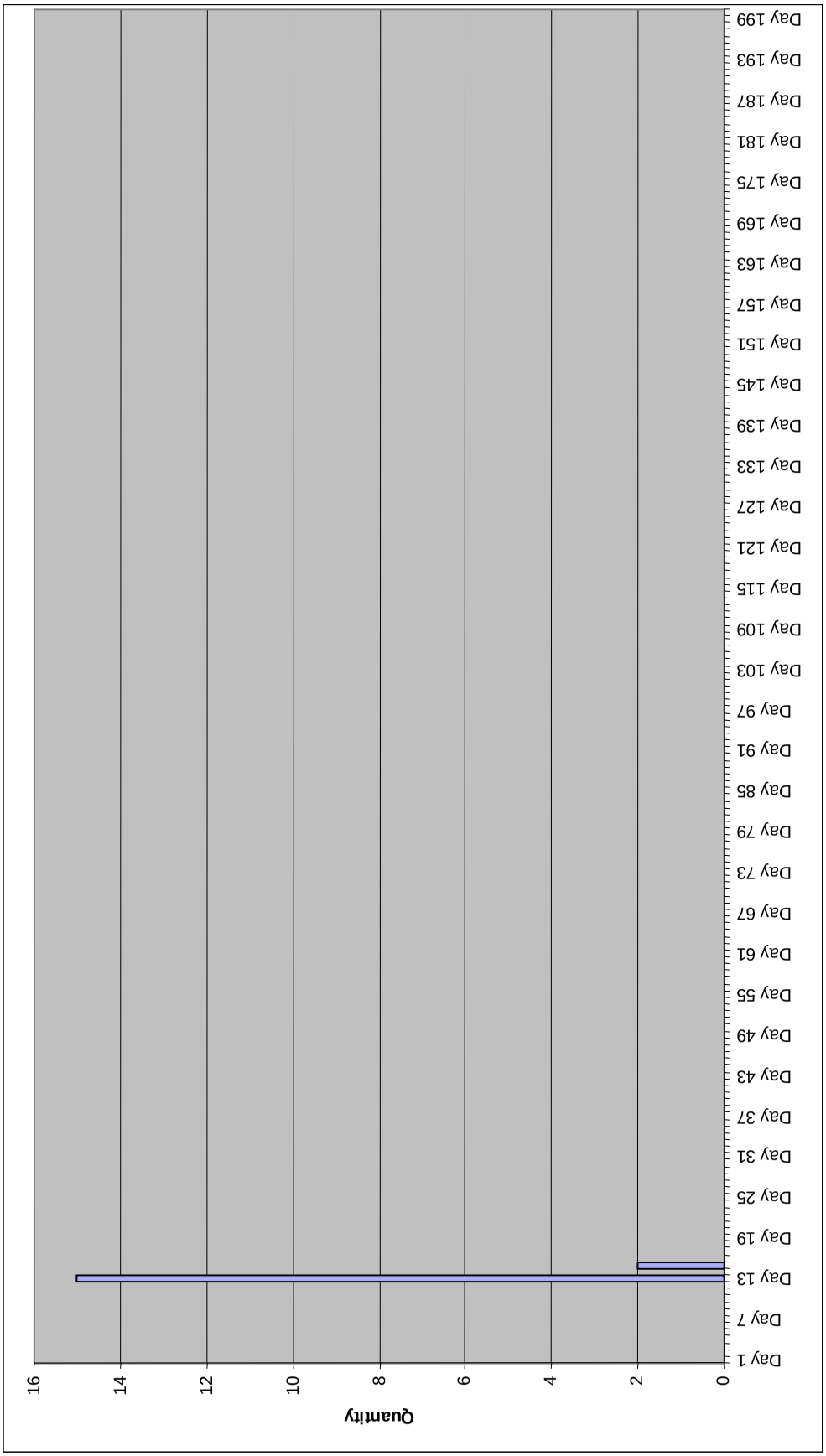

Figure 23. Quantity of Aircraft Self-Deploying to the Port New York/New Jersey

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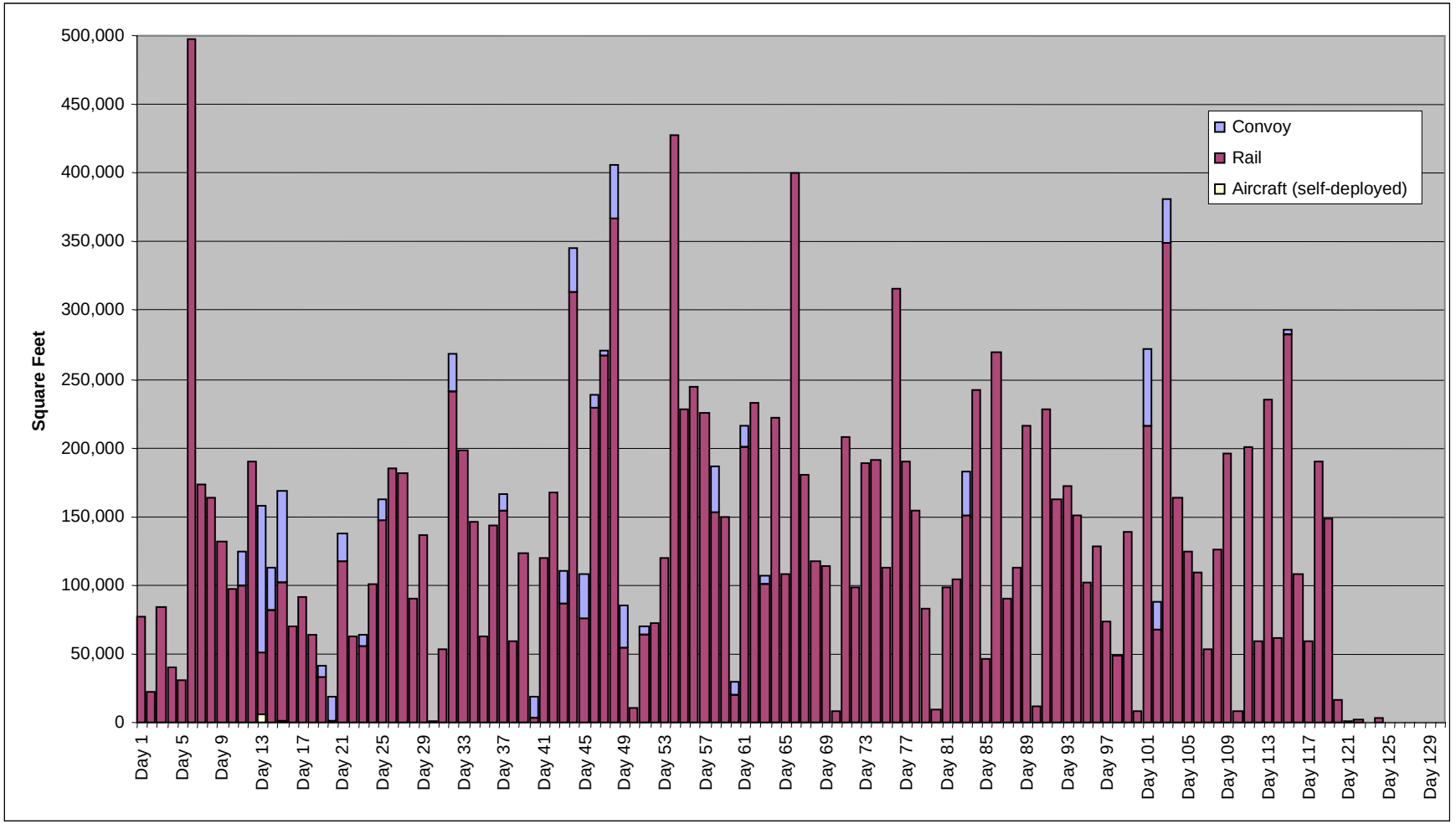

Figure 24. Square Feet of Cargo Items Arriving by Mode to the Port New York/New Jersey

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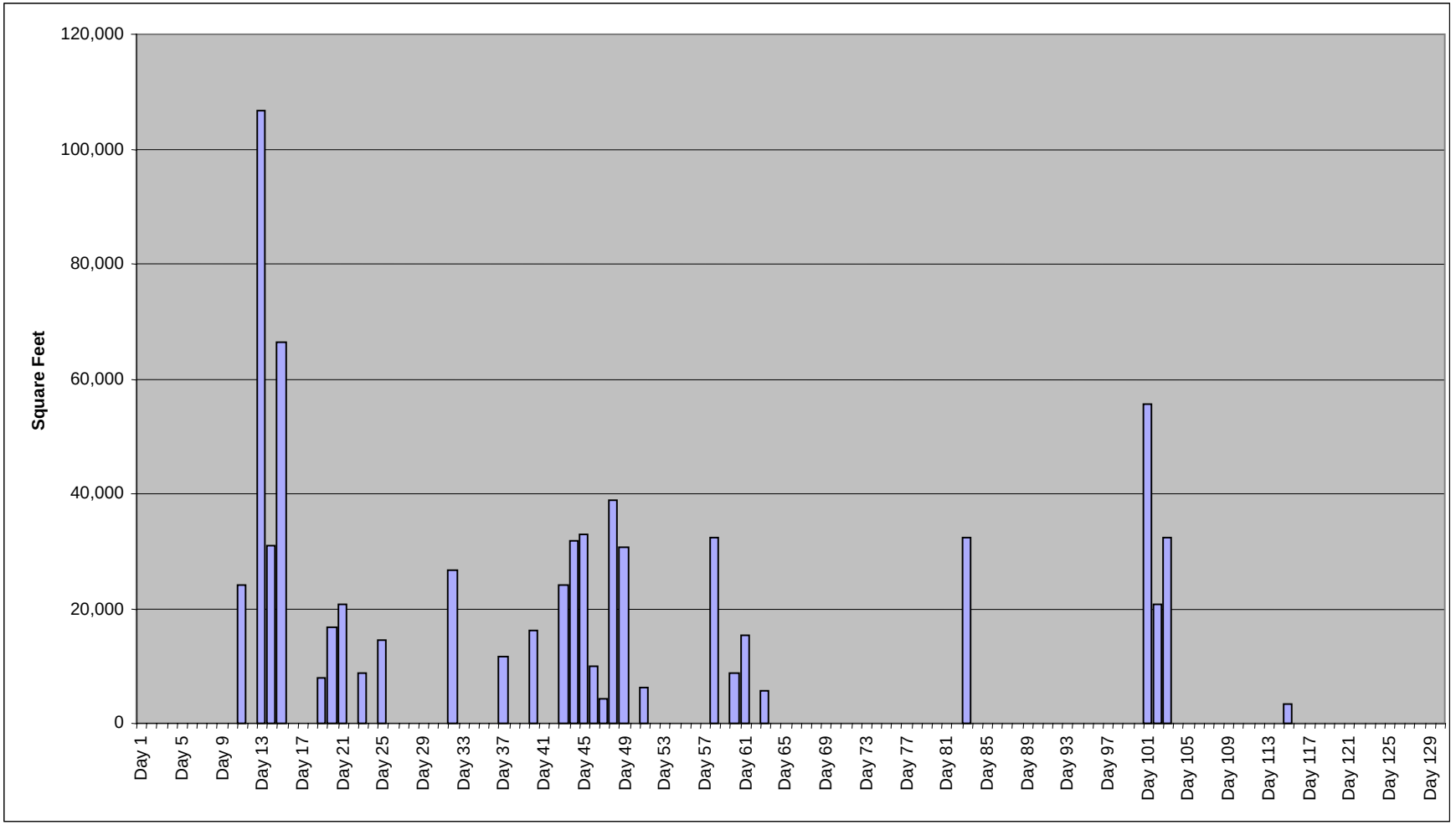

Figure 25. Square Feet of Wheeled Vehicles Convoying to the Port New York/New Jersey

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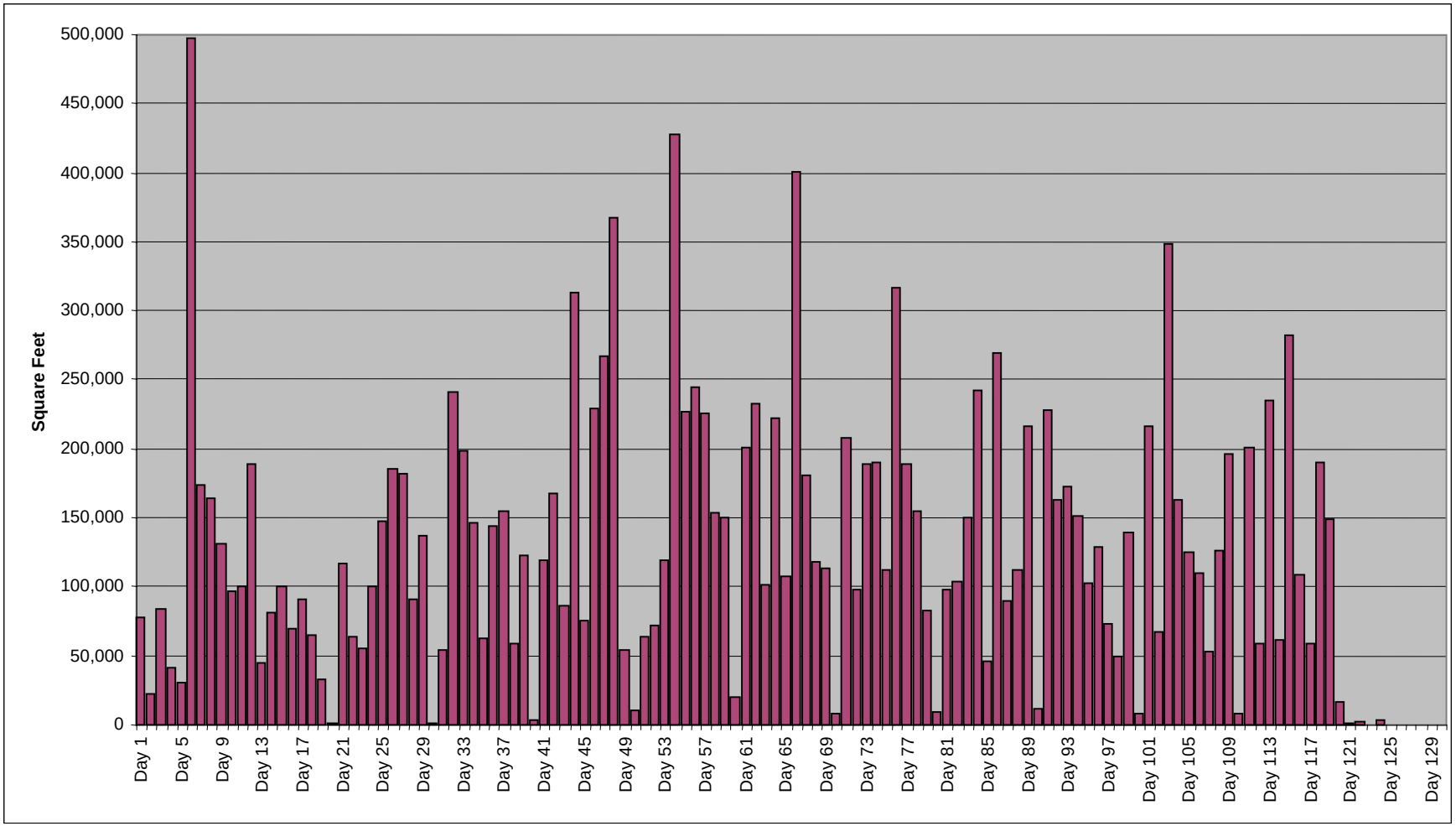

Figure 26. Square Feet of Cargo Items Arriving by Rail to the Port New York/New Jersey

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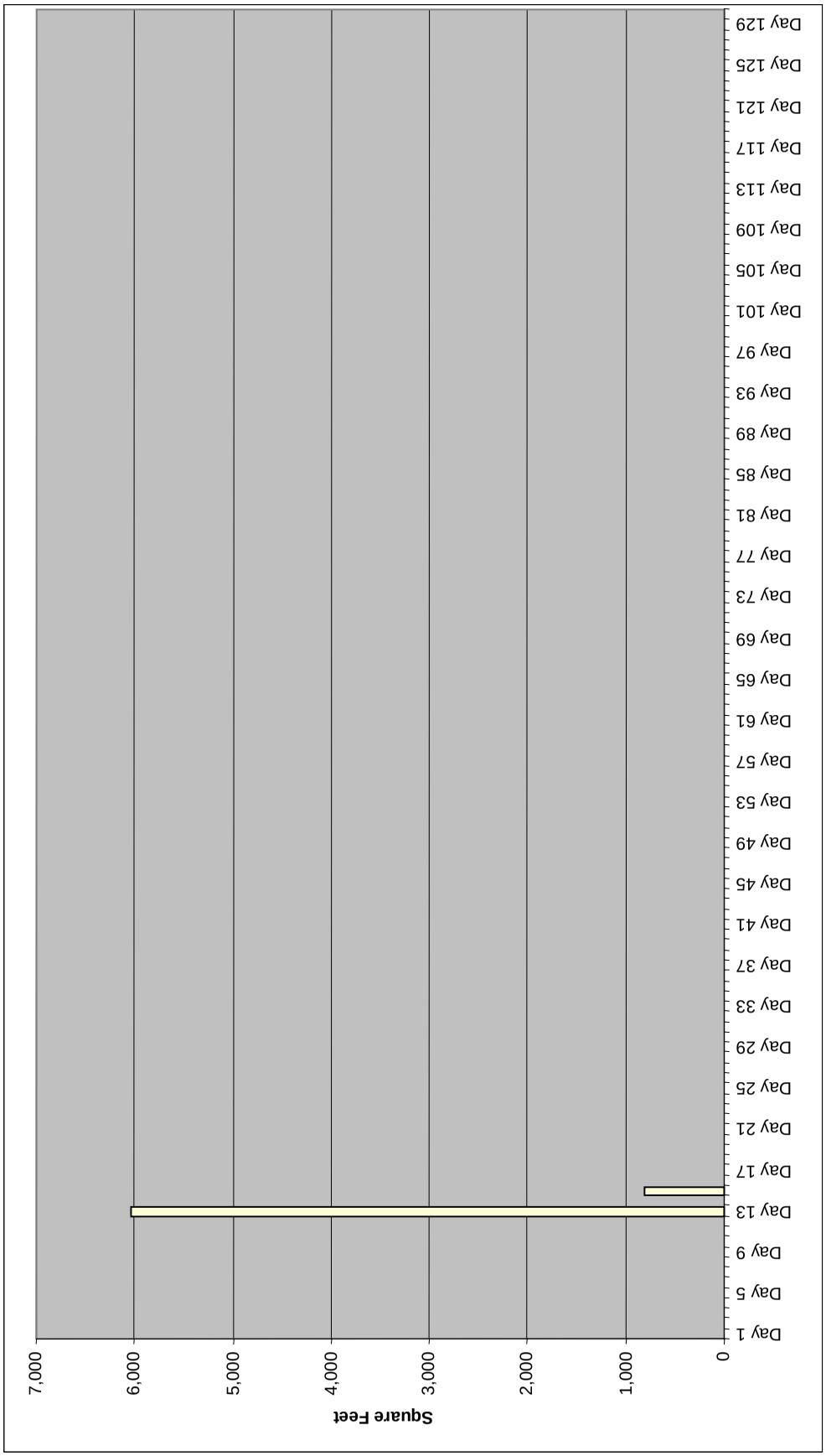

Figure 27. Square Feet of Aircraft Self-Deploying to the Port New York/New Jersey

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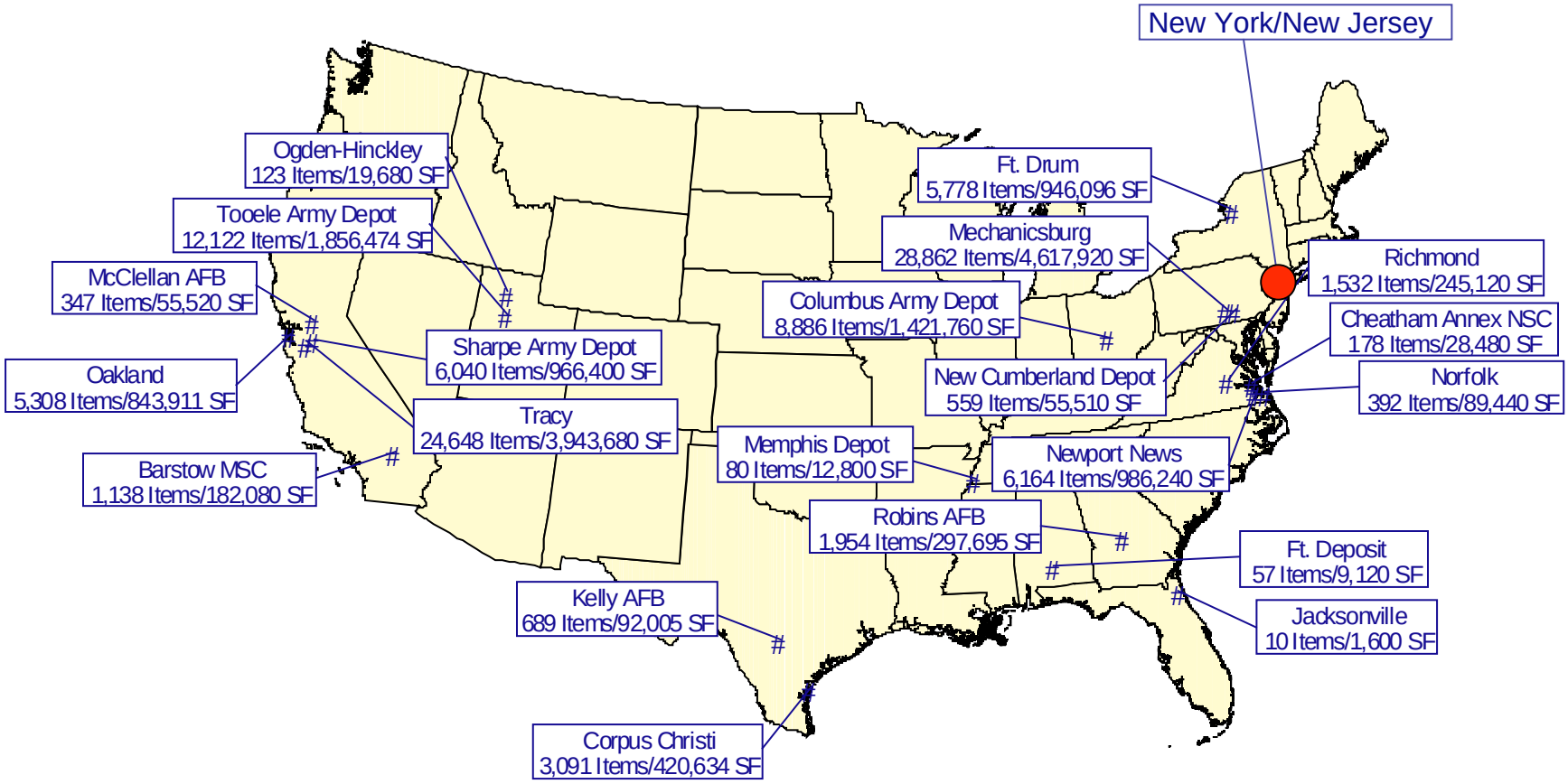

Figure 28. Amount of Cargo Arriving at the Port New York/New Jersey by Origin

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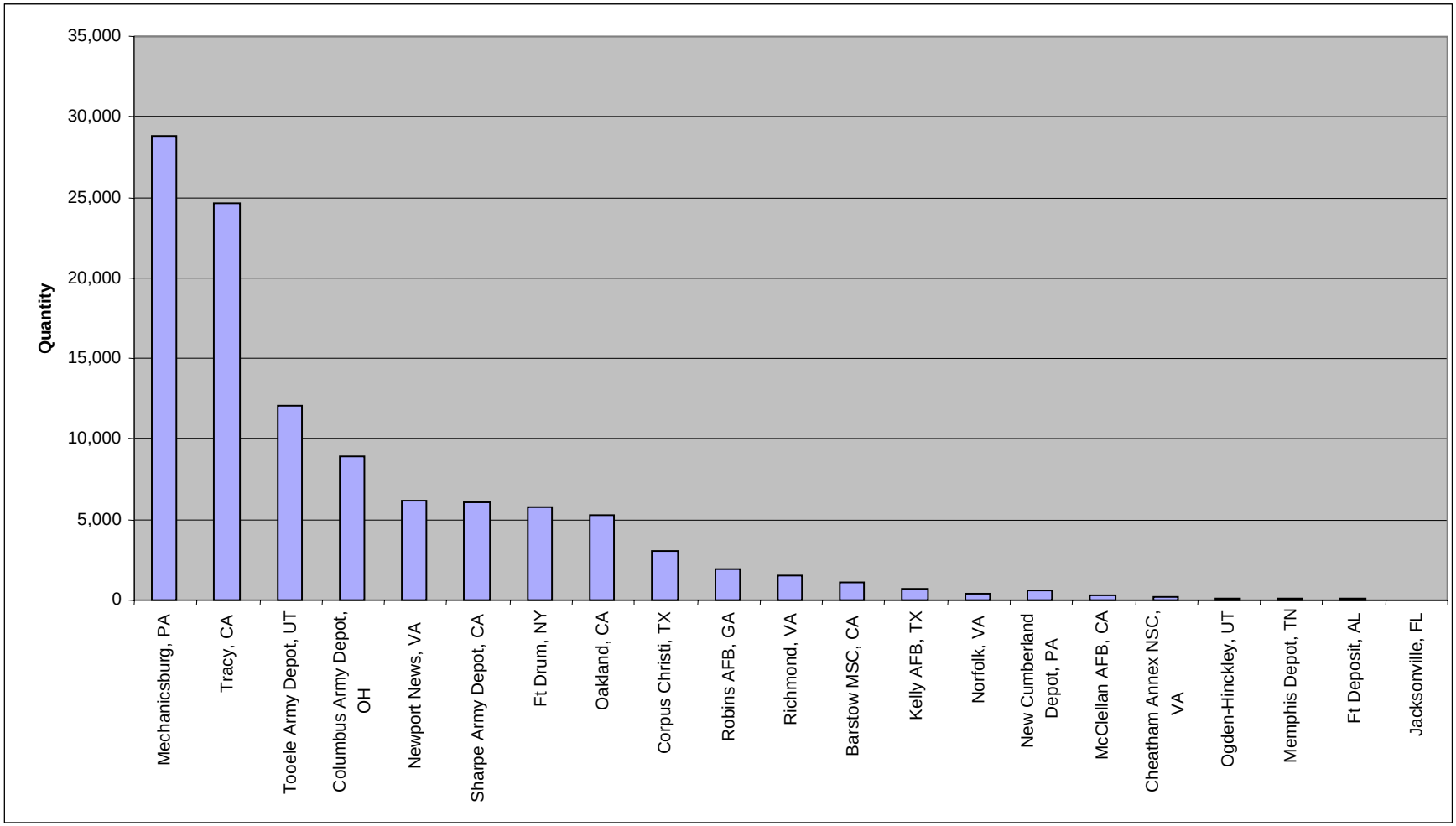

Figure 29. Quantity of Items Arriving at the Port New York/New Jersey by Origin

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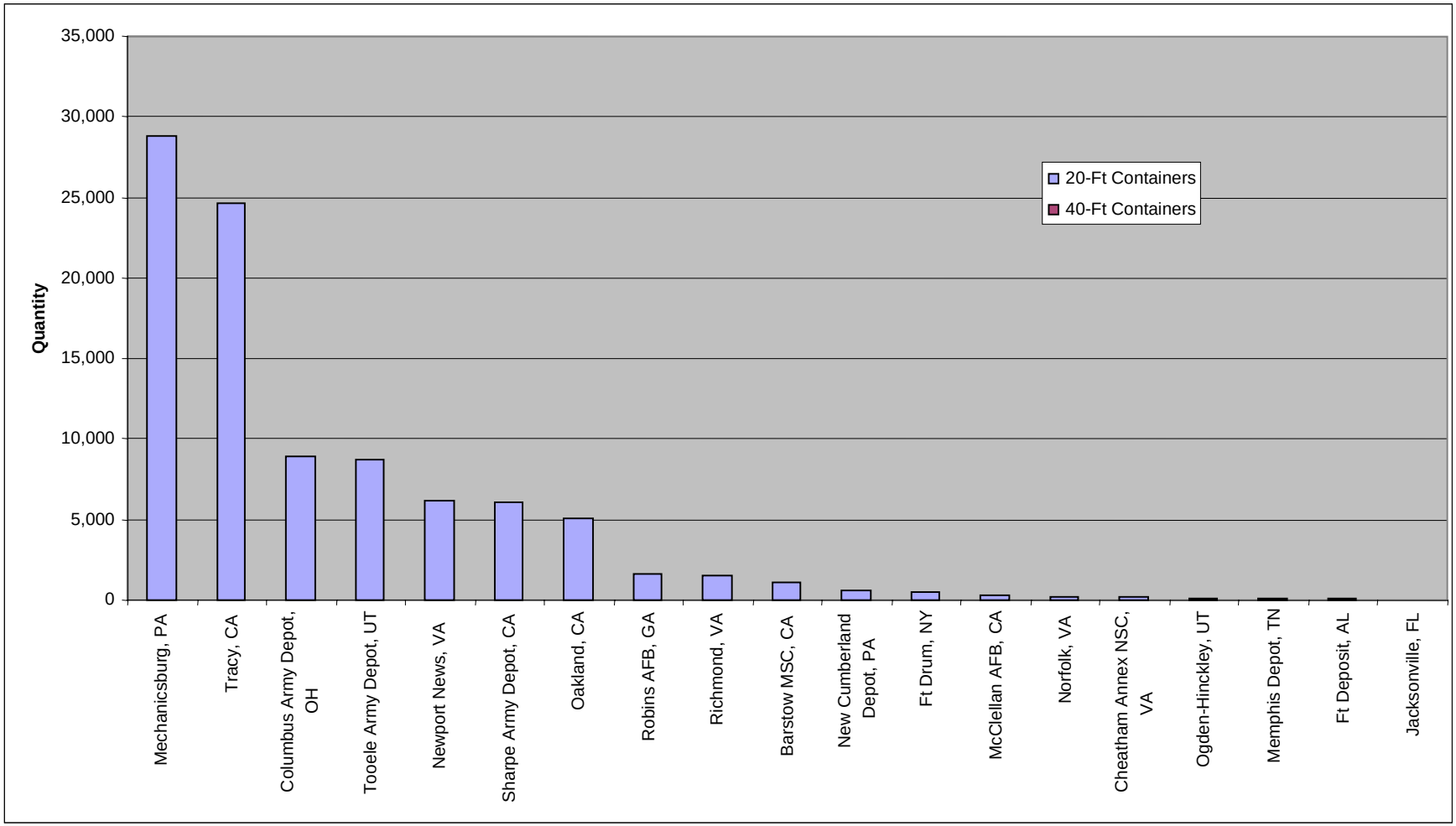

Figure 30. Quantity of Containers Arriving at the Port New York/New Jersey by Origin

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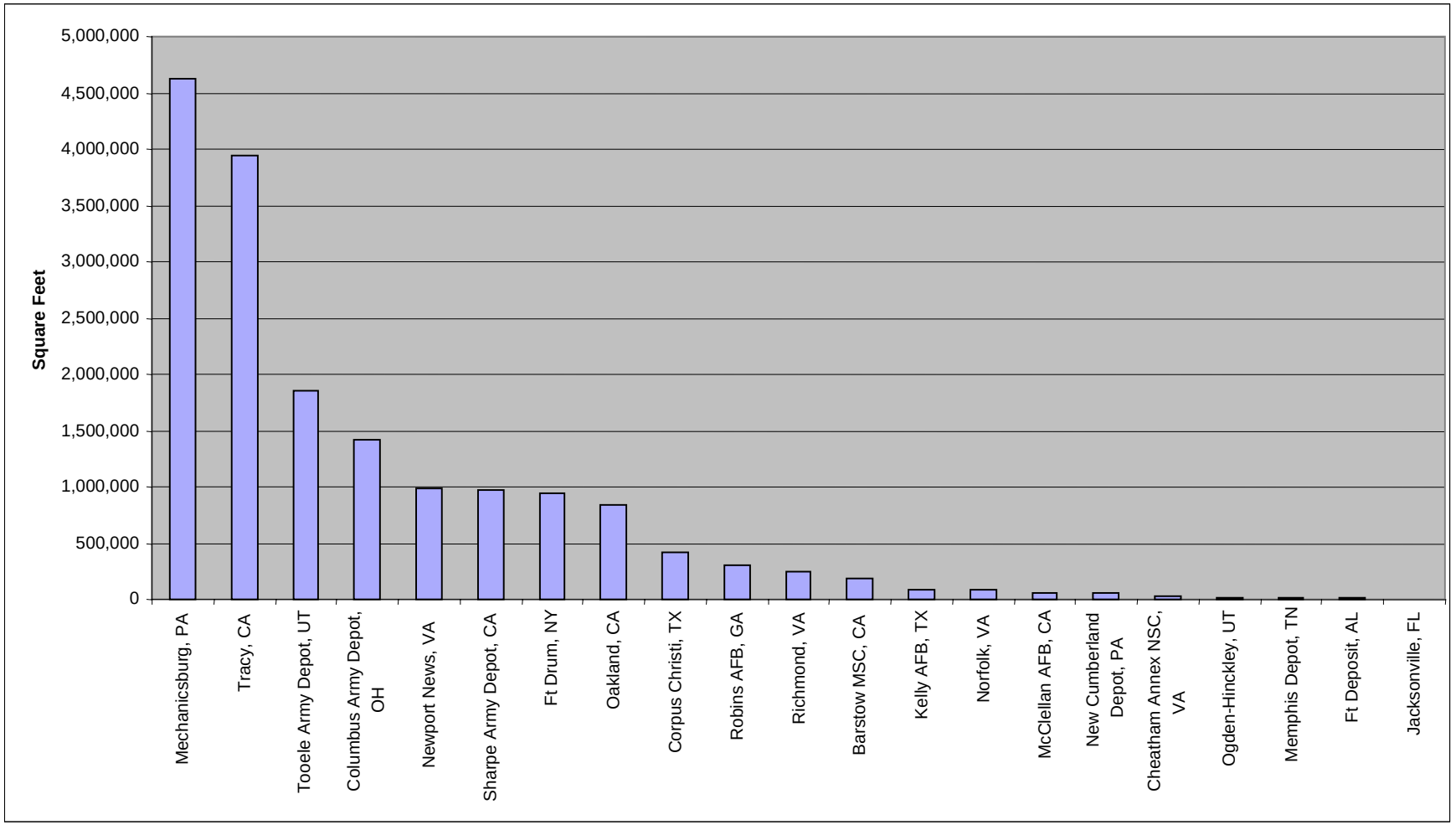

Figure 31. Square Feet of Cargo Arriving at the Port New York/New Jersey by Origin

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